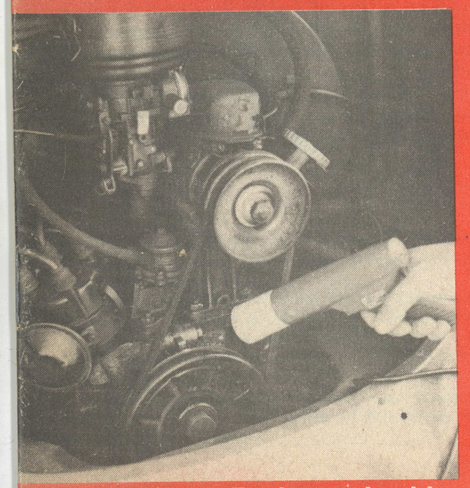
CHOICE

January 1978

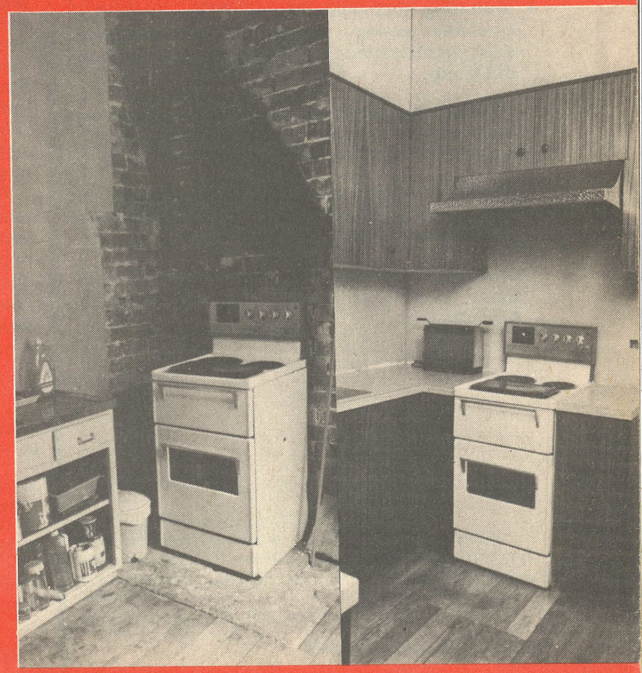
Pocket cameras

Compost bins



Engine tuning kits

Mini TV



Kitchen renovations

International Testing Technical Advisory Service

When the International Organization of Consumers Unions held its Asia and Pacific Regional Seminar in Penang, Malaysia, in October, 1976, one of the Seminar's recommendations was the establishment of a Consumer Testing Technical Advisory Service to assist consumer organizations in this important part of their work. The Service has been launched with the support of the Australian Consumers' Association. The scope of the Service includes:

- providing technical advice on any aspect of consumer testing – suggestions as to test plans, equipment needed for carrying out tests, methods of testing;
- undertaking of tests or parts of tests – goods can be purchased in a member organization's country and sent to ACA for specific tests to be done;
- providing training at ACA for staff of consumer organizations in the Region in the various aspects of consumer testing;
- providing qualified personnel on a short term basis to help train staff in new consumer organizations;
- assisting with the writing and printing of reports and articles, and providing resource material which could guide other organizations in carrying out tests.

Proposals for assistance under the Advisory Service are evaluated by the Regional Technical Advisor of IOCU at the IOCU Regional Office for Asia and the Pacific in Penang.

Assistance already provided by ACA to consumer organizations in the Region are tests of ball point pens for the Philippines and for Singapore, and tests of powdered baby milk for Indonesia. Advice has been given to the Regional Office on relevant Standards and procedures for testing electric light bulbs.

In addition, arrangements have been made for a staff member of the Hong Kong Consumer Council to spend a training period with ACA in Sydney.

The IOCU Asia and Pacific Regional Seminar recognized the need for the longer established consumer organizations to help the newer member organizations towards self sufficiency. The Consumer Testing Technical Advisory Service is a practical means of providing help which is now beginning to show results.

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We plan to report soon on electric stoves, kitchen knives, and mops and floor cleaners.

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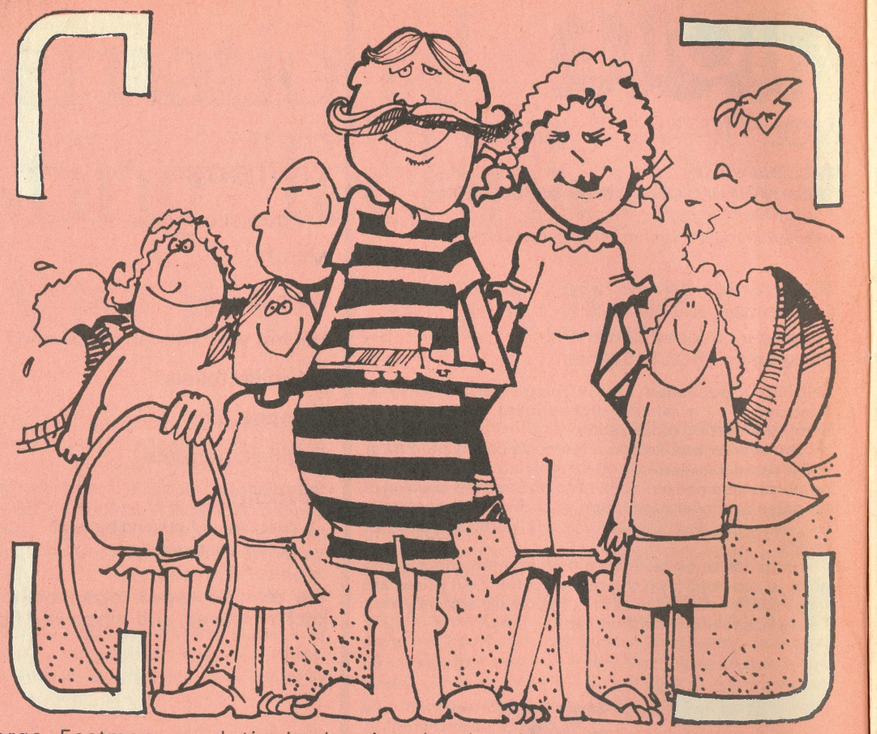
110 POCKET CAMERAS



In 1888 George Eastman revolutionized photography with the introduction of the Kodak No. 1 camera and a marketing philosophy based on the motto "You press the button – we do the rest". Kodak continues to dominate photography worldwide with a similar philosophy. In 1963 Kodak introduced the very popular 126 size film cartridge and 'Instamatic' cameras. Worldwide sales of the 126 cameras passed 50,000,000 in 1970.

Kodak's realization that the average 'snapshot' photographer wants to take a picture quickly, effortlessly, and with some guarantee of success – without having to become steeped in a lot of mumbo jumbo – led to the popularization of the instant loading cartridge. With the light-tight film cartridge there is no fiddling about with film ends, no risk of exposing the film accidentally while loading or unloading; there is only one way, the right one, of inserting the cartridge. ACA last reported on 126 size cameras in CHOICE, April, 1972.

The 'Instamatic' cameras are slightly larger than pocket size and some people feel sensitive about visibly carrying a camera. In an effort to get people to carry a camera with them at all times, Kodak introduced to the Australian market the 'Pocket Instamatic' cameras in 1973. These cameras also have instant cartridge loading, but the cartridge is smaller and so are the cameras – in fact, they are truly pocket size.

The original idea, in this case, was not Kodak's. A number of brands had been selling equally small cameras for many years which used 16 mm movie film in short lengths loaded into small cartridges. These 'spy' cameras were never really popular. It was Kodak who improved cartridge design, developed new films and produced a range of cameras from the simplest to the quite complex, and successfully marketed them to the world.

Kodak introduced a new film size, 110, with a frame size 13 mm x 17 mm. To get the traditional size print (about 9 cm x 12 cm) from this negative requires considerably more enlargement than from the larger 126 (28 mm square) and 35 mm (24 mm x 36 mm) films.

When 110 film was first introduced, only Kodak cameras and film were available in the new format. However, a number of other manufacturers now offer a range of cameras and film in the 110 size.

What we bought

We bought the cheapest manually operated camera using 110 film in each brand and the cheapest widely available automatic camera in each brand selling for under $120. Wherever possible we tried to buy the camera only; however, most of the cameras come in a kit of some kind, often including a roll of film, flash cubes or flash gun, carrying case and other accessories. Batteries were not supplied for the electronic flash gun with HANIMEX 110 ES, nor for the flash cube holder with HANIMEX Hanimette 110, nor for the MINOLTA Pocket Autopak 250 camera.

Details of our purchases are shown in Table 1.

Instructions and guarantees

All the basic cameras have a one year guarantee covering parts and labour for defects in materials and workmanship, except FOCAL Tele Focal 110 which is guaranteed for six months by the manufacturer – and in addition Coles offers a 'guarantee of satisfaction or your money back'.

All the automatic cameras have a guarantee covering parts and labour for defects in materials and workmanship, but the guarantee period varies. The longest guarantee period was from KODAK, which offered a three year guarantee with the Trimlite Instamatic 38. There was a one year guarantee with HANIMEX 110 ES and MINOLTA Pocket Autopak 250, and COPAL Pocket 400 has a two year guarantee. Only HANIMEX and KODAK supplied written guarantee information with the camera.

During testing we discovered that the shutter was not operating correctly in KODAK Trimlite Instamatic 38 camera. The camera was replaced with another by Kodak under the terms of the guarantee. The new camera has the same guarantee as the replaced one.

The mask on FOCAL Tele Focal 110 which indicates the field of view for the telephoto lens jammed on our camera and we had the camera replaced under warranty.

The instructions supplied with the cameras were, in the main, judged to be good. Those with AGFA Autostar are very brief but fairly well illustrated. The instruction booklet with HANIMEX 110 ES makes no mention of the battery required for the camera to operate, although a battery was supplied and its position is indicated when the back of the camera is opened. With MINOLTA the instructions for two models are combined into one book and we found this slightly confusing.

Features

Basic cameras The basic cameras are just that – you do not get many features. They are limited to a fixed aperture and one or two shutter speeds. AGFA Autostar and HALINA Minimatic 103 were the only ones with two shutter speeds (the second speed being automatically selected by the camera when a Magicube type X was plugged in). The fixed exposure limits the camera to being a 'fair weather friend' – photographs taken on dull or cloudy days can be underexposed, though with black and white or colour print film the wider latitude and degree of correction available during printing greatly reduces this effect.

Within a limited distance you can use flash, indoors or out. Each camera had provision for flash of some kind. Four cameras have batteryless Magicube type X and two take flip flash (also batteryless); the other basic camera, HANIMEX Hanimette 110, takes the original flash cubes which require batteries (which were not provided with the camera) – see Table 1 for details.

A problem when using flash with colour film is that, if the flash is mounted too close to the camera lens and the subject looks straight into the camera, you can capture a bright red reflection from the back of the eye. This effect, known as 'red-eye', can be largely eliminated by mounting the flash further away from the camera and asking the subject not to look directly at the camera. Three cameras supplied a flash extender to mount the Magicubes type X a distance above the camera. An extender is also available for flip flash but was not supplied with any of the cameras with flip flash facilities.

COPAL Pocket 400 – camera accessories and instructions presented in a box that can be used for storage after purchase.

TABLE 1

Brand and model	Price paid ($)	Origin	Film included†	Flash facilities*	included	Comments
Basic models						
AGFA Autostar	17.50	Germany	12 AGFA prints	X	1 cube	tripod socket
FOCAL Tele Focal 110	29.98	Japan	12 KODAK prints	F	1 flip flash	tripod socket, telephoto lens
FUJICA Pocket 200	30.00	Japan	none	X	1 cube	carrying case, flash extender, tripod socket, cable release socket
GAF Personal 2	12.25	Hong Kong	none	F	none	
HALINA Minimatic 103	12.95	Hong Kong	none	X	none	flash extender
HANIMEX Hanimette 110	11.95	Hong Kong	12 HANIMEX prints	C	1 cube	flash requires two AAA batteries (not supplied)
KODAK Instamatic 92	19.48	England	12 KODAK prints	X	1 cube	flash extender
Automatic models						
COPAL Pocket 400	89.95	Japan	12 FUJI prints	H	electronic	carrying case, tripod, tripod socket, LED battery check
HANIMEX 110 ES	59.00	Japan	none	H**	electronic	batteries not supplied for flash (two AM3) tripod socket, cable release socket
KODAK Trimlite Instamatic 38	119.50	U.S.A.	20 KODAK prints	F	1 flip flash	tripod socket, cable release socket, LED battery check, lens cover slide
MINOLTA Pocket Autopak 250	90.00	Japan	none	H, X	none	carrying case, battery not supplied for camera, tripod socket, cable release socket, LED battery check, lens cover slide and lock

†All film included was colour print film

*F – Flip flash socket
H – Hot shoe
X – Magicube type X
C – flashcube socket (removable)

**Non-standard
Flash cubes and Magicube type X give four flashes, flip flash gives eight flashes

Low shutter speeds and lightweight cameras can lead to camera shake, resulting in fuzzy photographs. Three of the basic cameras have a tripod socket so that they can be used on a normal photographic tripod. FUJICA Pocket 200 also has a cable release socket.

The FOCAL Tele Focal 110 has an additional lens which slides across in front of the normal lens, giving a magnified image. The magnification makes objects about two-thirds larger on the photograph than they would be if only the normal lens were used.

All the cameras have a double exposure prevention interlock so that you cannot take two photographs on the one frame. They have a fixed focus lens with a claimed depth of field typically 1.5 m to infinity (see Table 2).

GAF and HANIMEX Hanimette 110 have a rotary film winder – you just push the disc round with your left thumb until the film stops at the next frame. The others have a sliding film advance operated conveniently by the right thumb.

Automatic cameras The automatic cameras have more features, as you might expect for the higher price. All have an electronically timed shutter controlled by a light sensor. The time the shutter remains open varies automatically from a few seconds to several thousandths of a second, depending on the amount of light available. If the light requires a shutter speed slower than about a thirtieth of a second, each of the cameras displays a red indicator light when the shutter release is slightly depressed, to warn you that you need to rest the camera on something solid or mount it on a tripod to avoid camera shake.

COPAL Pocket 400, KODAK Trimlite Instamatic 38 and MINOLTA Pocket Autopak 250 have a battery check function which shows a red light if the battery is **not** flat. You could easily forget this negative warning: a serviceable battery is essential because none of the cameras will operate without one. MINOLTA Pocket Autopak 250 did not supply the battery; we had to buy it as an extra. All except COPAL Pocket 400 have the battery in the film compartment, so that it cannot be replaced without fogging the film if the camera is loaded.

HANIMEX 110 ES has three focus positions, the others have two positions (see Table 3).

COPAL Pocket 400 and HANIMEX 110 ES come with an electronic flash gun; with MINOLTA Pocket Autopak 250 it is optional and we bought the camera only. KODAK Trimlite Instamatic 38 has facilities for flip flash only. The Kodak and Hanimex companies market electronic flash guns which will fit into a flip flash socket. HANIMEX 110 ES has a non-standard flash socket so that you can use only the electronic flash gun supplied with the camera. COPAL and MINOLTA have standard flash gun hot shoes so you don't have to worry about connecting a cable from the flash gun to the camera.

MINOLTA also has a facility for Magicubes type X.

Each of the cameras has a tripod socket and all except COPAL have a cable release socket. COPAL was the only camera supplied with a small pocket size (non-adjustable) tripod.

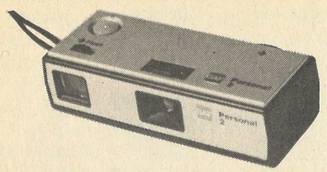
KODAK supplied 78 peel-off letters which can be attached to the camera to form three initials.

KODAK and MINOLTA have a lens cover slide to protect the lens when the camera is not in use and also to lock the shutter on MINOLTA so that you cannot accidentally trip it.

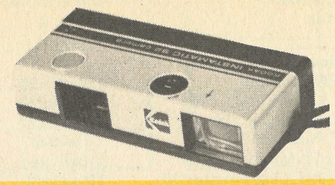
110 POCKET CAMERAS

BASIC MODELS

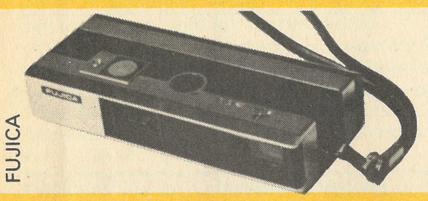
GAF



KODAK Instamatic 92

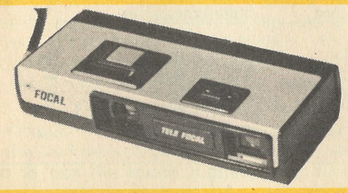


FUJICA



HANIMEX Hanimette 110

FOCAL



HALINA

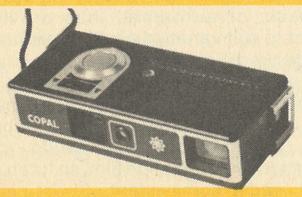
AGFA

AUTOMATIC MODELS

HANIMEX 110 ES

MINOLTA

COPAL



KODAK Trimlite Instamatic 38

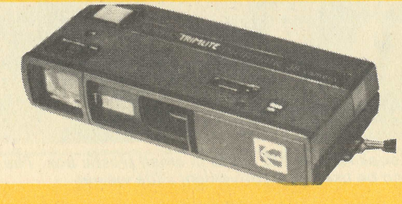


TABLE 2

Brand and model	Dimensions l x d x h (mm)	Mass* (g)	Focussing range stated/measured (m)	Pincushion distortion	Viewfinder accuracy***
Basic models					
AGFA Autostar	130x47x29	99	1.2 to ∞/0.8 to ∞	very slight	•••
FOCAL Tele Focal 110	135x58x30	153	1.5 to ∞/0.8 to ∞**	very slight	•••
FUJICA Pocket 200	130x55x27	140	1.5 to ∞/0.8 to 3.4	none	••
GAF Personal 2	115x45x33	91	1.5 to ∞/0.8 to 4.2	very slight	•
HALINA Minimatic 103	119x57x28	112	1.5 to ∞/0.8 to ∞	none	••
HANIMEX Hanimette 110	115x45x30	85	1.5 to ∞/0.8 to ∞	very slight	•
KODAK Instamatic 92	117x53x28	84	1.2 to ∞/0.8 to ∞	none	••

*Camera only
**Telephoto setting 3 to ∞/1.0 to ∞
***•••Whole of intended picture is present, centrally located
•• Whole of intended picture is present, not centrally located
• Some of the intended picture is missing

TABLE 3

Brand and model	Dimensions l x d x h (mm)	Mass* (g)	Focussing range (m) close-up stated/measured	Focussing range (m) distant stated/measured	Viewfinder accuracy ***
Automatic models					
COPAL Pocket 400	114x51x28	141	1 to 3/0.5 to 3.4	3 to ∞/1 to ∞	•••
HANIMEX 110 ES	136x57x30	163	1 to 2/0.9 to 3.0**	5 to ∞/1.6 to ∞	••
KODAK Trimlite Instamatic 38	130x60x28	184	1 to 2/0.5 to 3.0	2 to ∞/1 to ∞	••
MINOLTA Pocket Autopak 250	139x59x28	205	0.9 to 1.8/0.5 to 3.0	1.8 to ∞/1 to ∞	•••

*Camera only, including battery
**has intermediate range marked 2 to 5, measured 1 to 5
***•••Whole of intended picture is present, centrally located
•• Whole of intended picture is present, not centrally located
• Some of intended picture is missing

Kodak returns 110 slides in small plastic box. The box lid can be used as a convenient slide viewer.

Film

Kodak introduced 110 size film and has the widest range of film available; Verichrome pan (125 ASA, black and white, 12 exposures), Kodachrome 64 (64 ASA, colour slide, 20 exposures) and Kodacolor II (80 ASA, colour print, 12 and 20 exposure). Available on special order are Tri-X (400 ASA, black and white), Ektachrome (64 ASA, colour slide) and Kodacolor 400 (400 ASA, colour print). We found only six other brands of 110 film and they offered only colour print film.

Prints are usually 9.0 cm x 11.5 cm, with larger sizes available on special order. Slides are returned in 30 mm x 30 mm mounts in a plastic box which can be used as a slide previewer.

It should be noted that none of the cameras we tested (basic or automatic) has provision for adjustment to suit variations in film sensitivity (ASA rating). The predictable result was that colour slide film in our tests appeared underexposed except with the basic cameras used in very bright lighting conditions, while colour print film and black and white film produced acceptable results – print film has a wider latitude than slide film, so it can be under or overexposed to some extent without a noticeable

Projectors for 110 slides

Special projectors are available for 110 size slides – Hanimex Rondette 110RF, Kindermann Fernfocus 110 and Pradovit Color 110.

If you already own a 35 mm projector, you can use it to project 110 size slides if you use special adaptor mounts. These are made by Kodak and cost $5.26 for 100 or $2.05 for 20. (Kodak will not return 110 slides in 50 mm x 50 mm mounts as used for 35 mm slides).

Using a 35 mm projector, the image on the screen will be smaller with 110 size slides unless the projector is moved to a greater distance or a different lens is fitted – but both definition and illumination will then be worse compared with that for 35 mm slides.

loss of print quality. Only MINOLTA's instructions contained a warning that the camera was not intended to be used with film which has a higher rating than 125 ASA. FOCAL, HANIMEX 110 ES and both KODAKs specified the type of film which has a higher rating than 125 ASA. FOCAL, HANIMEX 110 ES and both KODAKs specified the type of film which should be used in the cameras. FUJICA claims the camera accepts any 110 film type. If you attempt to use the much higher rated films (400 ASA) in these cameras, you can expect to overexpose them severely unless you take photographs in very dim light, and then only with the basic cameras which have fixed shutter speeds. The higher rated film would considerably increase the distance at which you could take flash photographs – but the closest distance at which you could take them without overexposure would also increase.

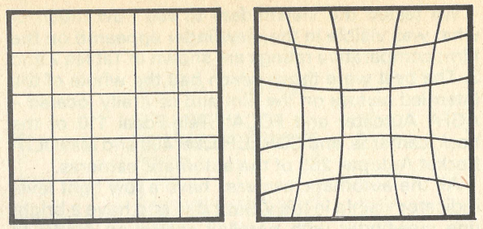
Distortion and sharpness

We found very slight pincushion distortion with four of the basic cameras (see Table 2); the others had no measurable distortion.

Within the range where the camera focussed, we found all cameras produced sharp images to the limit of the capability of the film we used, around 30 lines per mm (Verichrome pan, black and white) and around 37 lines per mm (Kodachrome 64 slides). In other words, the camera lenses could resolve sharper images than the film (and that is the way it should be).

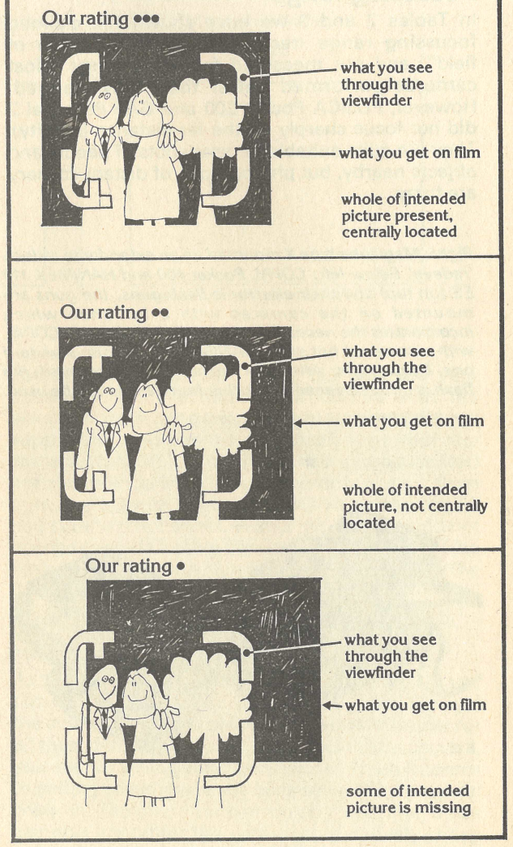
Viewfinder accuracy

What you see in the viewfinder should be what you see in the final print or slide. If the viewfinder shows you more than will appear on the film, there is a risk of cutting off your subjects' heads or feet, or otherwise missing out on some important detail. If it shows much less, you might find your picture spoiled by something you didn't want included.



The effect of pincushion distortion is shown in the right hand diagram. Though present in some of the basic cameras, the effect was not sufficiently marked to be serious.

Viewfinder accuracy


Our rating •••
what you see through the viewfinder
what you get on film
whole of intended picture present, centrally located
Our rating ••
what you see through the viewfinder
what you get on film
whole of intended picture, not centrally located
Our rating •
what you see through the viewfinder
what you get on film
some of intended picture is missing

We tested the viewfinders to see how much of what was visible in the viewfinder appeared on the film; comparative ratings are shown in Tables 2 and 3. The best were those which had the whole of the intended picture on the film and centrally located – AGFA Autostar and FOCAL Tele Focal 110 of the basic cameras, and COPAL Pocket 400 and MINOLTA Pocket Autopak 250 of the automatic cameras.

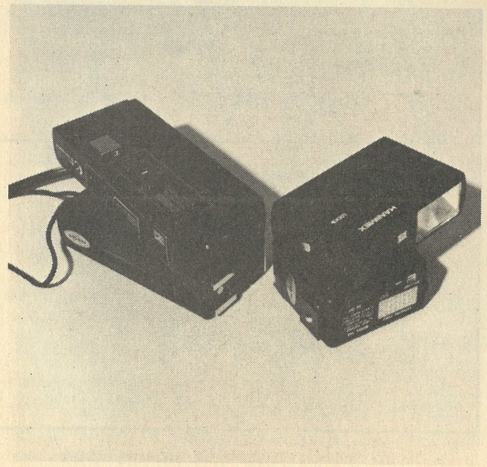
All the automatic cameras have a low light level indicator visible in the viewfinder, and have a bright line viewfinder with parallax correction marks to indicate the field of view when taking close-up photographs.

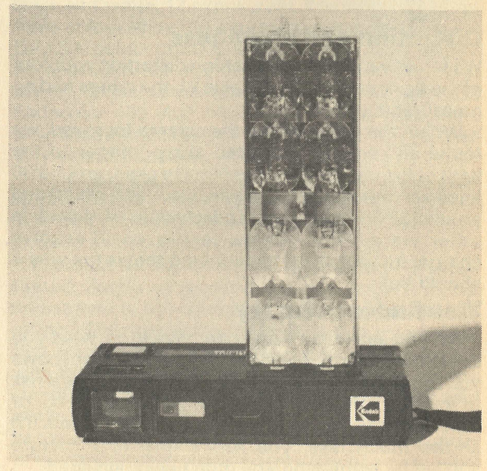
KODAK Instamatic 92, COPAL Pocket 400 and MINOLTA Pocket Autopak 250 have an indication in the viewfinder when a fresh Magicube type X is needed.

Focussing range

In Tables 2 and 3 we have shown the claimed focussing range (technically termed "depth of field") and our measured focussing range. Most cameras performed better than they claimed. However, FUJICA Pocket 200 and GAF Personal 2 did not focus sharply on the far distance (infinity). They are quite suitable for snapshots of people and objects nearby, but photographs of distant scenery are fuzzy.

Right: Magicube type X mounted on an extender to reduce 'redeye'. Below left: COPAL Pocket 400 and HANIMEX 110 ES (on top) and their electronic flash guns; the guns are mounted on the cameras with a hot shoe which incorporates the necessary electrical connection – COPAL with a standard hot shoe, HANIMEX with a non-standard one. Below right: After four flashes have been used, flip flash is turned over and the other four flashes can be used.

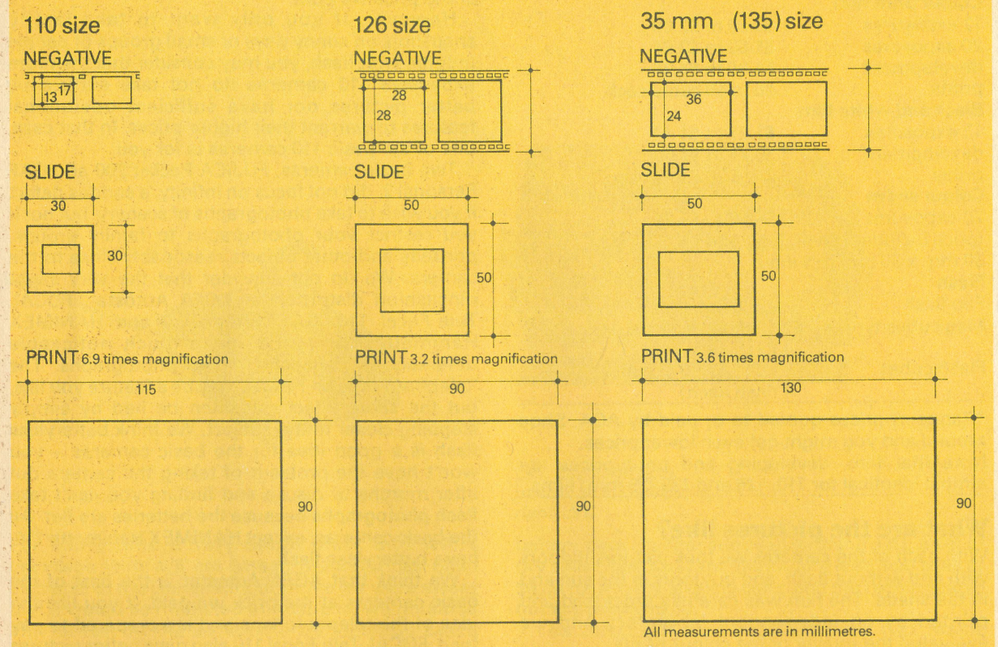




Flash

Four different types of flash were supplied with the cameras (see Table 1). HANIMEX Hanimette 110 was the only camera to use the original flash cube; these cubes require batteries to fire them, and Hanimex did not supply them with the camera. You could find that after a few months' disuse the batteries were flat and you wouldn't be able to take flash photographs until you purchased new ones. We found the flash on HANIMEX Hanimette 110 to be unreliable in operation (the flash did not always fire if the batteries were old).

Magicubes type X are fired by a mechanical prong which juts up from the camera when you press the shutter release. There are four bulbs on each cube



and we found them to be very reliable; if one of the bulbs fails to fire, it does not affect the unused bulbs in the cube.

Flip flash has eight bulbs arranged in two sets of four in a long flat holder. The flip flash is fired by a piezoelectric generator built into the camera and does not need batteries – but if one of the bulbs should fail to go off (and we did have this problem occasionally) then the remaining bulbs at that end can't be used with GE and Sylvania flip flash.

With Philips "Top flash" you can break out the fusible link between the bulbs by hand, thus allowing the next bulb to be fired. This feature can be turned to advantage; if you break out the fusible links between two or three of the bulbs before use, you can get two or three bulbs to fire simultaneously, hence increasing the distance to which the flash will light up the scene. Two bulbs together increase the distance to 1.4, and three bulbs to 1.7, times the distance for a single bulb.

COPAL Pocket 400 and HANIMEX 110 ES each supplied electronic flash guns, and MINOLTA Pocket Autopak 250 offers an electronic flash gun as an optional extra. Electronic flash guns are generally not as powerful as bulb flash, but they are very cheap to run. We had no difficulties with the electronic flash guns supplied, but Hanimex did not supply the batteries for the flash gun with the camera. HANIMEX 110 ES also had a non-standard hot shoe for the flash, so you can only use the flash gun supplied with the camera; COPAL and MINOLTA had standard hot shoes. With a hot shoe you do not need to connect a cable between the camera and the flash gun; the connection is made by mounting the flash gun on the camera.

Running costs

As you can see from our illustration (above), 110 size film is a lot smaller than 126 or 135 (35 mm) film, yet the costs for film and processing are very similar for all these film sizes. By buying a pocket size camera, you are not saving very much money when it comes to getting prints made. We have set out some typical costs in Table 4. You can quickly see that these cameras are rather like pets – comparatively cheap to buy in the first place, but quite expensive to feed.

TABLE 4 Running costs of cameras*

Colour print film	
12 exposures	$0.99 to $2.09
20 exposures	$1.50 to $2.64
development	$1.30 to $1.35
prints	40 to 50 cents each
Black and white film	
12 exposures	$1.27 to $1.44
development	$0.75 to $1.00
prints	24 to 26 cents each
Colour slides	
20 exposures	$4.50 to $5.25
(price includes developing and mounting in 30 mm x 30 mm mounts)	
Flash	
Flip flash	$2.23 (8 flash each)
Magicubes type X	$2.10 to $2.75 (3 cubes, 4 flash each)
Flash cubes	$1.60 to $2.00 (3 cubes, 4 flash each)

*Range of prices quoted to or paid by ACA. Shop around and you might get even lower prices.
Note that film, developing and print prices are almost identical for 110, 126 and 135 (35 mm) films.

What are the pictures like?

With each of the cameras we took pictures indoors with and without flash, and outdoors in the sun and in the shade. The film was carefully processed and printed by an independent laboratory and we evaluated the quality of the colour prints.

At the outset we must comment that a set of photographs taken for comparison at the same time and under the same conditions with a 35 mm camera were in all cases ranked better than any of the prints from the 110 cameras.

Comparison of the prints was made on the basis of general appeal, colour, sharpness and exposure.

The photographs from the 110 automatic cameras were, in general, better than those from the 110 basic cameras. There was little difference between the automatic cameras, but of the basic cameras AGFA Autostar and FOCAL Tele Focal 110 stood out consistently as better than the others. The basic cameras as a group were markedly inferior to the automatic cameras when used away from bright sunlight.

Conclusions

If you value compactness and portability in a camera and pictures are to be taken under a wide range of lighting conditions, and you want a 110 size camera, then you should consider one of the automatic cameras that we tested. All took good photographs under varied lighting conditions. COPAL and MINOLTA had the best viewfinders and COPAL supplied the best kit of extras with the camera. HANIMEX 110 ES represents good value for money at the price we paid.

However, if you only want to take family snapshots on sunny days or small groups of people indoors with flash, you may consider that the more expensive 110 cameras do not take sufficiently better pictures nor have sufficient operational features to warrant their higher prices. In that case, one of the basic 110 cameras is for you.

Two basic cameras, FUJICA Pocket 200 and GAF Personal 2, did not focus on infinity, a serious defect if you wish to take photographs of scenery, but not if you restrict your photographs to family groups, portraits and other objects reasonably close to the camera. We do not consider that the very slight pincushion distortion in AGFA Autostar, FOCAL Tele Focal 110, GAF Personal 2 and HANIMEX Hanimette 110 would make much noticeable difference in "snapshot" type photographs. The 'telephoto' lens on FOCAL may be a feature you like, but the same effect can often be had by simply stepping closer to the subject. We think batteryless flash is a good idea for the basic cameras – you won't have the problem of taking the camera out after months of disuse and finding you can't take flash photographs because the batteries are flat. All the basic cameras, except HANIMEX Hanimette 110, have batteryless flash.

We think that AGFA Autostar is the best of the basic cameras at the price we paid. If you like the idea of the telephoto lens and are prepared to pay for it, FOCAL Tele Focal 110 also gave better pictures than the rest of the basic cameras.

Remember that 110 cameras do not produce as good pictures as 35 mm cameras but that the pictures are very similar in cost. If you buy a basic 110 camera, it won't take you very long to exceed its purchase price in the cost of prints or slides you take with it. For those who wish to compare the two types, ACA published a report on the more expensive single lens reflex cameras in CHOICE, August, 1977.

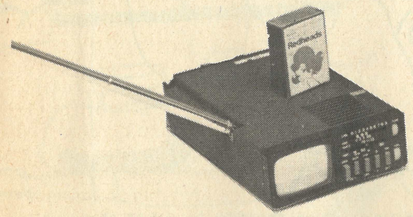
Recommendations

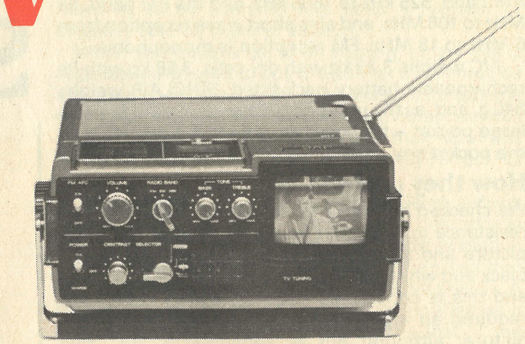
Basic camera	
AGFA Autostar	$17.50
FOCAL Tele Focal 110 (with telephoto lens)	$29.98
Automatic camera (good value for money)	
HANIMEX 110 ES	$59.00

Pre-publication check

We found AGFA Autostar at $13.95, FOCAL Tele Focal 110 at $27.98, and HANIMEX ES 110 at $59.95.

Mini TV





Left, SINCLAIR with matchbox for comparison; right, JVC.

For some time a very small black and white television with a 5 cm screen diagonal has been available in the United Kingdom. As we were aware that it would be marketed in Australia, we obtained one for test. At the same time we found on sale a model with a 7.5 cm screen diagonal, which also incorporated an AM/FM/SW radio, and we bought this too for test. The two sets are not strictly comparable, except in being much more expensive than the typical small black and white portable with a 30 cm screen.

What we bought

The SINCLAIR Microvision Pocket TV is to be put on sale in Australia shortly at a recommended retail price of about $425.00. The larger JVC 3050AUL we bought for $220.00, its recommended retail price being $229.00.

Both came with an earphone and SINCLAIR with a carrying case. The instruction book for JVC is very good, that for SINCLAIR adequate. JVC comes with a two year written guarantee covering parts and labour; SINCLAIR's written guarantee covers repair or replacement without charge for 12 months.

Power supplies

Both models operate from a variety of power sources. JVC came with both an external mains power adaptor and an adaptor for connecting it to a car cigarette lighter. It will also run on six internal D type dry cells or a rechargeable nickel cadmium battery pack (neither supplied with the set); a set of dry cells costs $2.52 for heavy duty lead acid cells or $6.00 for a set of alkaline cells, and the rechargeable battery pack $55.00.

The SINCLAIR was supplied with two mains power adaptors, one for North American 117 V 60 Hz supplies and the other for European, British or Australian 220-240 V 50 Hz supplies; for the Australian market the 220-240 V unit is fitted with a standard Australian three pin plug. SINCLAIR also comes with an internal rechargeable battery, an adaptor for connecting the set to a car cigarette lighter, and an external battery box which will accommodate four D type dry cells (not provided).

We checked the time the sets would run on their rechargeable batteries. JVC claims 12 hours on a charge – our technician had square eyes by the time it stopped working after 15 hours. SINCLAIR claims to run for four hours and on test averaged about three and three-quarter hours.

What they'll do

Both sets have continuously variable tuning for television, like a radio receiver. JVC covers all present Australian TV channels, but has no provision for reception of UHF TV. SINCLAIR will not receive the Australian channels 0, 4, 5 and 5A; channels 0 and 5A are unique to Australia, and the 4 and 5 marked on SINCLAIR's scale are not those

used in Australia. It covers all other Australian VHF TV channels, and also UHF channels (not yet in use in Australia) between 470 MHz and 890 MHz.

JVC provides radio reception on the widely used AM band, 525 kHz to 1605 kHz, and the FM band, 88 MHz to 108 MHz, and also short wave reception from 6 MHz to 18 MHz. FM reception is monophonic.

JVC weighs 3.29 kg with dry cells, 3.58 kg with its rechargeable battery pack fitted. SINCLAIR weighs 840 g, and, as the photograph shows, would fit into a large pocket – though over a period it wouldn't do the pocket any good.

How they performed

We checked both sets for television sensitivity and resistance to adjacent channel interference, and for picture and sound quality. JVC gave a noise free black and white picture with an input signal of 1 mV, and this is considered good sensitivity. SINCLAIR required an input level of 10 mV for a noise free picture; although not as sensitive as JVC, this performance would be adequate in most locations. Both pictures were good with inputs at these levels; SINCLAIR's tended to become worse with a very strong signal. To tune the set accurately on UHF channels required great care. TV sound quality was very good in JVC, which has a 12 cm speaker and separate treble and bass tone controls; SINCLAIR's sound distorted badly on full volume – its speaker is necessarily very small. JVC had the better performance on adjacent TV channel rejection, but both were adequate in this respect.

The radio section of JVC was very sensitive on FM reception, adequate on AM and short wave bands. As with TV sound, quality was good for a portable set.

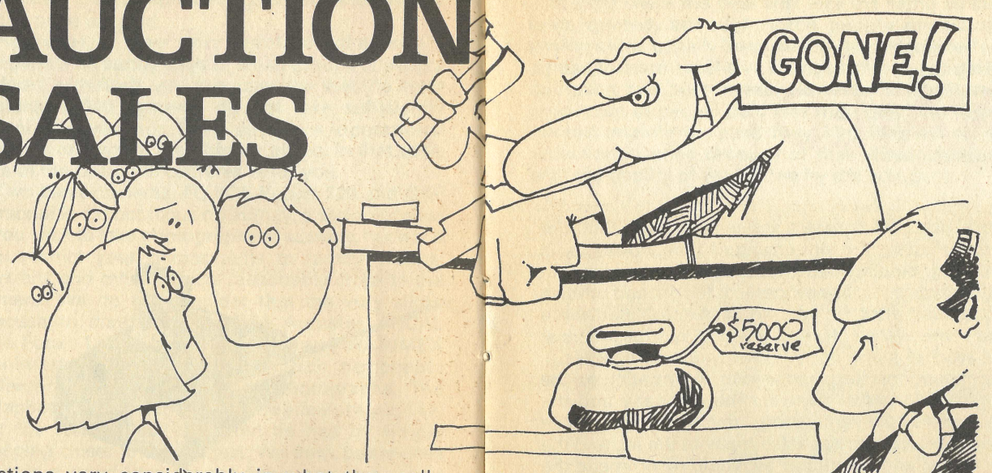
Conclusions

The small size of SINCLAIR is a remarkable technical achievement, but the set is expensive. For the person who has everything, it would make an intriguing present. But the screen size is so small that the proper viewing distance is only about 30 cm – it's strictly your personal set; even two people would have difficulty viewing together. For Australia, it cannot receive some channels.

At around half the price and with a good quality radio receiver incorporated, JVC is more versatile (except for lack of provision for future UHF TV), a better performer and could be watched by two people at a time at a distance of about half a metre. But it won't fit even an outsize pocket.

The two sets are not really comparable. With the limitations mentioned, both are adequate performers. Whether either of them is useful and worth the money, only the individual user can say – how badly do you feel you need a *very* small black and white TV at a pretty high price?

AUCTION SALES



Auctions vary considerably in what they sell, although they are all run in basically the same way. Broadly speaking, they can be divided into types – regularly held auctions which offer a wide variety of goods of a similar category (for example, furniture or household goods) and specialist auctions, where high quality goods of a special type are auctioned (for example, coin or stamp auctions).

Most sales take place in the auctioneer's salerooms, but they can occur elsewhere – for example, auctions selling the contents of a house may often take place at the house itself. You can find out when and where there are auctions by looking up the auction columns in your daily or local newspaper or by contacting local auctioneers listed in the business section of your telephone directory. If you are interested in antiques you can look in specialist magazines.

The following information applies to both general and specialist auctions, but is not generally applicable to auctions of real estate.

How to buy

If a catalogue is available, try to get hold of it before the sale day and go through it thoroughly before the viewing. You should personally inspect any goods that you are interested in as you will have to rely on your own appraisal of them at the viewing when deciding how much to bid at the auction. Take a note of the lots in which you are interested. Then, in the catalogue beside each lot that interests you, mark down how much you are prepared to pay. It is a good idea to be familiar with current new and secondhand prices for the goods you are seeking. You could ask the saleroom staff for an estimate of what each lot will fetch, to see if you stand a chance.

On the day of the auction, arrive early to get a seat near the front, where the auctioneer can see you. When your lot comes up, start bidding by raising your hand or calling out clearly if necessary. Don't be afraid of blowing your nose – the auctioneer won't think you're bidding – but try not to fan yourself with your catalogue, which could easily be taken for a bid. Stick to your price limit, or at least don't go more than one bid over – it's quite easy to get carried away. Make sure you are bidding for the correct lot – check the lot number before you start. If you make a mistake and realise that you are landed with the wrong lot, tell the auctioneer's clerk immediately. You may feel silly, but it's worth it if he agrees to reoffer the lot.

If you really hate bidding or if you can't attend the sale itself and you want the auctioneer's staff to bid for you, write down the lot number of the item you're interested in and your price limit – an instruction to purchase – and give it to the saleroom staff. If you're not well known, you may be required to leave a deposit along with your bid. But it's usually best to bid for yourself, since advance bids may push up prices.

Having successfully bid for your lot, the next stage is to pay for it. You should be prepared to pay cash on the nail, although some auctioneer's accept a deposit of around 25 per cent and the balance to be paid shortly afterwards. Goods must be removed from the auctioneer's premises by a given date (normally within two or three days). Check whether the auctioneer will arrange for delivery and compare his quote with someone else – it may be cheaper to arrange your own transport.

The legal implications

In each State and Territory, sales by auction are governed by legislation and auctioneers are required to be licensed and keep a register of property sold by them at auction.

When you make a bid at an auction, at law this is regarded as an offer to buy the goods, which may be accepted or rejected by the auctioneer. If he accepts your offer, the sale is complete when he announces its completion by the fall of the hammer. Until this announcement is made, any bidder may retract his bid.

An auction sale may be notified as being subject to a reserve price, which means that if this price is not reached in the bidding, the goods are passed in without being sold. However, it is not required that the auctioneer announce what the reserve price is. A right to bid by the seller may also be notified as a condition of the auction, which means that, if the seller is not satisfied with the price reached, he may make a bid himself to prevent sale at too low a price. Unless such a right is expressly reserved to the seller, neither he nor any person employed by him may make a bid at the auction.

Certain conditions and warranties are implied in every sale of goods, the most important of these being that the goods are of merchantable quality and fit for the purpose for which they were intended (where that intention is made known to the seller at the time of the sale). These implied conditions are given under State legislation and also apply to sales by auction. Similar conditions are also implied under the Trade Practices Act in relation to consumer sales by corporations, but auction sales are specifically excluded from the operation of that Act. Therefore, you must rely on the conditions implied under State legislation.

In all States and Territories the implied terms of fitness for purpose and merchantable quality may be expressly excluded by the conditions of sale at the auction. If this is done then you must ensure that the goods work properly and will do the job you want – otherwise you may well have no recourse against the seller (that is, the person actually selling the goods, not the auctioneer, who is merely his agent).

Conclusions

To buy at auctions as painlessly as possible:

- read the catalogue before viewing, and read between the lines
- examine the goods thoroughly
- mark down the maximum price you are prepared to pay and stick to it
- bid clearly
- pay for and collect the goods promptly.

HAVING YOUR KITCHEN RENOVATED?

Do you have a problem kitchen where, no matter how you arrange it, you're cramped for space? Or are you just tired of the same old layout and want to give your kitchen a facelift?

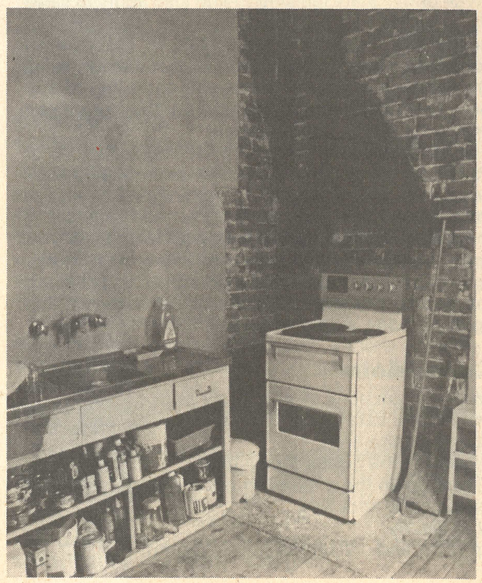
Companies specialising in kitchen renovations offer themselves as the answer to your problems. They will do the whole job, from the plumbing and electrical wiring to installing new cupboards and benches and appliances, painting, and putting in a new ceiling or floor. Sounds good? Yet, if the experiences of some of our subscribers are any indication, some kitchen renovation companies can be just the start of your problems.

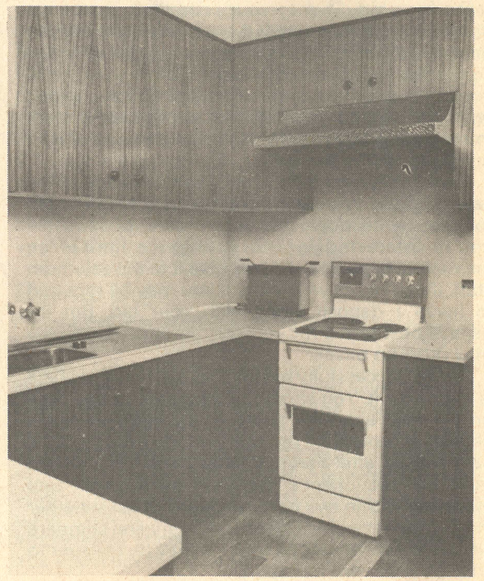
While one in four subscribers responding to our kitchen renovations questionnaire were completely satisfied with the work done by the company they had employed, the majority of the respondents found fault with some aspect of the quality of work done or the reliability of the company. Delays in work, need for constant supervision, workmen not turning up at the pre-arranged time, mistakes in ordering, sloping benchtops, cupboard doors that either wouldn't close properly or fell off, and rubbish left around after the job had been completed, were just some of the criticisms levelled by subscribers at the work of some kitchen renovation companies.

Respondents supplied us with information on the original quotation given by the company and the final cost of the renovations the type of guarantee they received, their satisfaction with the job and the company, and whether they would recommend the same one to other people.

Original quotation and final cost

Most people were quoted between $1500 and $3500 by kitchen renovation companies, the amount depending largely on the extent of renovations.

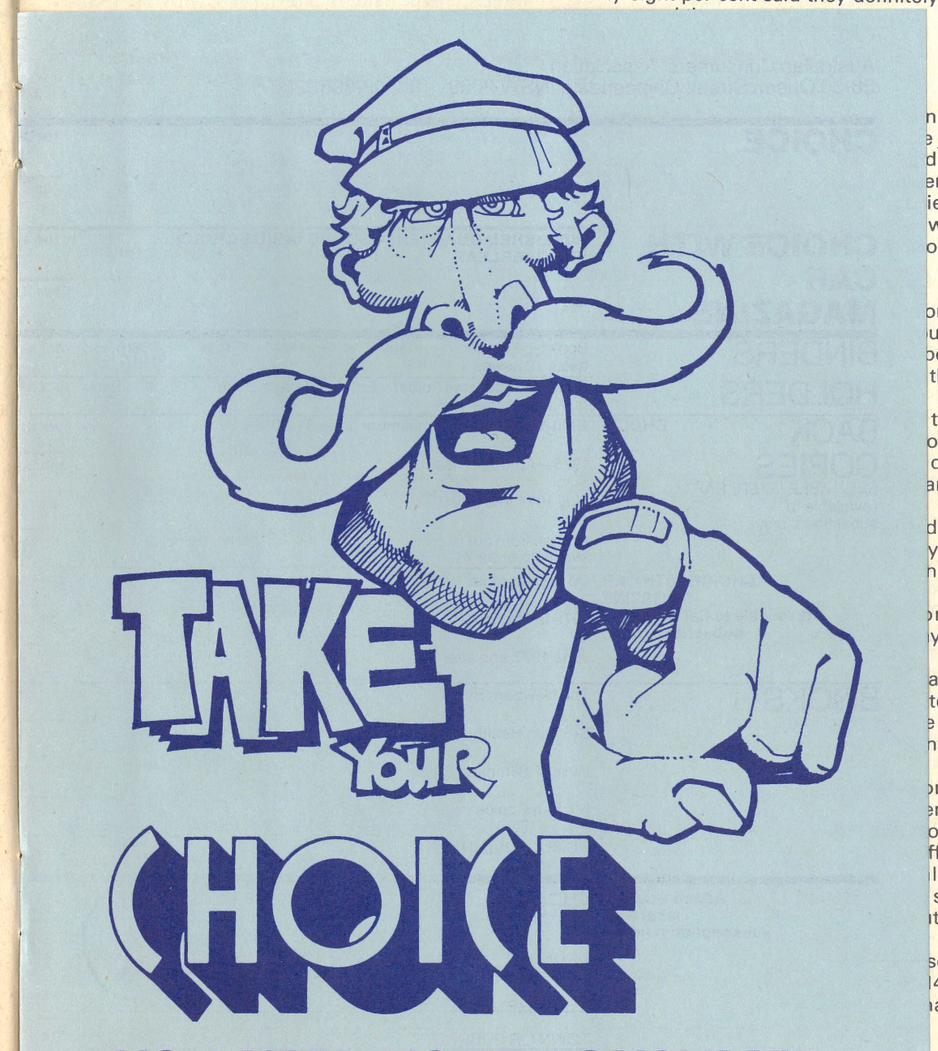




In most cases the final cost was the same as the price quoted, although some people ended up paying more, usually because they had requested or agreed to more expensive changes after the original quotation had been made. However, a significant proportion of people paid less than they had been quoted, mainly because they had insisted on a reduction in price because of their dissatisfaction with the quality of work done by the company.

Would they recommend the firm?

In view of the complaints made, it is not surprising that only half the respondents who had used a kitchen renovation company would recommend the same one to other people. Ten per cent said they would recommend it but with reservations, such as "yes, but they're expensive", or "yes, as long as you're prepared to keep a sharp eye on their work". Thirty-eight per cent said they definitely would not



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	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
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In most cases the final cost was the same as the price quoted, although some people ended up paying more, usually because they had requested or agreed to more expensive changes after the original quotation had been made. However, a significant proportion of people paid less than they had been quoted, mainly because they had insisted on a reduction in price because of their dissatisfaction with the quality of work done by the company.

Guarantees

Only one-third of respondents were given a written guarantee, a surprisingly small number in view of the cost of employing a kitchen renovation company, and the inconvenience if the work is delayed or unsatisfactory. A little over one-third were given an oral assurance that the job would be completed to their satisfaction. But if the schedule is not kept to, with this type of guarantee you've little means of redress, and you may simply have to live with a chaotic kitchen until the job is completed. One-quarter of respondents received no form of guarantee, written or oral.

Whether or not you receive a written guarantee does not necessarily depend on which company you deal with. From the replies of respondents, it seems that some companies are inconsistent in their behaviour in giving guarantees: one person may get a written guarantee, another using the same company may be given one orally, and a third may get none at all.

Most people who had received some form of guarantee said that either the company had abided by the guarantee or they had had no reason to call on it. However, a significant proportion of people said that the kitchen renovation company had not lived up to the guarantee.

Satisfied with the job?

While most people were satisfied with the overall job done by the kitchen renovation company, three out of four were unhappy with some aspects of the job.

Those who were satisfied with the job done or with some aspects of it were mainly impressed with the speed and efficiency of installation, the quality of workmanship (both in the installation and in the units installed), the attractiveness of the finished job, and the final layout and design.

The main reason for dissatisfaction with the job done or with some aspects of it was poor quality of workmanship in installation. Other major areas of complaint were the poor condition of the units installed and the failure of the company to complete the job in the specified time. Many people disliked the hard sell approach adopted by some salesmen.

Would they recommend the firm?

In view of the complaints made, it is not surprising that only half the respondents who had used a kitchen renovation company would recommend the same one to other people. Ten per cent said they would recommend it but with reservations, such as "yes, but they're expensive", or "yes, as long as you're prepared to keep a sharp eye on their work". Thirty-eight per cent said they definitely would not recommend the same company.

Conclusions

Half the respondents who used a kitchen renovation company were pleased enough with the job done to have no reservations about recommending the one they had employed to others. However, there are lessons to be learned from the experience of the other half of respondents who would not recommend the one they had used or who had reservations about doing so.

- Shop around for competitive quotes.
- Don't be pressured into signing a contract by a salesman, especially one who offers you a discount if you will sign on the spot. You may be better off not dealing with a company that adopts this type of pressure-selling technique.
- Insist on a written contract, with a time clause which binds the company to a completion date (and preferably a starting date, too), and full details of all work to be done, goods to be supplied, and cleaning up.
- Make sure you have a clause inserted stipulating liquidated damages if the company does not complete the work contracted for within the agreed time or within a reasonable time.
- Be careful of contracts calling for progress payments; make sure exactly what payments you are up for and at what stages.
- Beware of companies demanding half the total cost as deposit before work begins. A ten per cent deposit is quite enough, and it would be worth your while to retain ten per cent of the cost until the job is finished to your satisfaction.
- In the case of unsolicited door to door salesmen, you have the right to cancel within a certain period after signing the contract. In New South Wales, Tasmania and Victoria, the "cooling off" period is ten days; in the Australian Capital Territory, Queensland and Western Australia it is seven days, and in the Northern Territory and South Australia the time allowed is eight days.
- You can negotiate to have a clause inserted in the contract holding up final payment for 14 days after the job is completed to give you the chance to test the work.

CHEMICAL TOILETS

An increasingly popular acquisition of campers and caravanners is a portable chemical toilet. It offers you the comforts of home while you're travelling and the freedom of not having to worry about where you'll find your next toilet. No longer will you have to restrain nature's calls to fit the frequency of service stations along your route, or tie your holiday travels down to caravan and camping grounds. And ducking behind a tree is often not a feasible (or, indeed, responsible) alternative with so many people these days making their escape from the city.

With these portable chemical toilets, waste is stored in the holding tank until it's convenient to empty it into a sewage facility. The holding tank contains a chemical which, while not treating the waste, keeps the bacteria from multiplying and the odour within acceptable limits.

We bought four chemical toilets for testing to determine their effectiveness and practicality for holidaying.

What we bought

The most popular type of portable chemical toilet is the kind that you can flush, so we bought the flushing model in each of the four available brands. We did not buy a PERIDAN brand of toilet as it came onto the market too late for testing.

Details of the brands and models we bought are given in Table 1. They were purchased, along with the recommended chemicals, from caravan and tent accessory centres at the prices given in Table 1.

Capacity

Manufacturers in their claims tended to overestimate the number of times you could use the toilets before they would need emptying. Assuming an average of 280 ml of human waste per adult each time plus water for flushing, we've estimated the approximate number of times you could use the toilets before they would need emptying. It depends largely on the size of the storage tank, but also on the type of seal on the tank. A positive seal generally allows you to use the toilet to its capacity; a tank without a positive seal will have nothing to prevent the contents spilling while you're travelling or carrying it to be emptied (see Seals).

You could use ELSAN about 40 times before it was full (compared with the 60 times claimed). However, as it does not have a positive method of sealing off the contents of the holding tank, it would be advisable, especially if you were travelling, to empty the unit more frequently as suggested in the instructions, as the contents may spill. POT POURRI would take around 60 uses to fill (compared with the 100 flushings claimed) and has a positive seal; however, the unit would become very heavy to carry so you would need to empty it more frequently. Both THETFORD and TOTA have positive seals so that they can be used to full capacity – about 50 and 30 uses respectively (compared with 60 and 70 claimed).

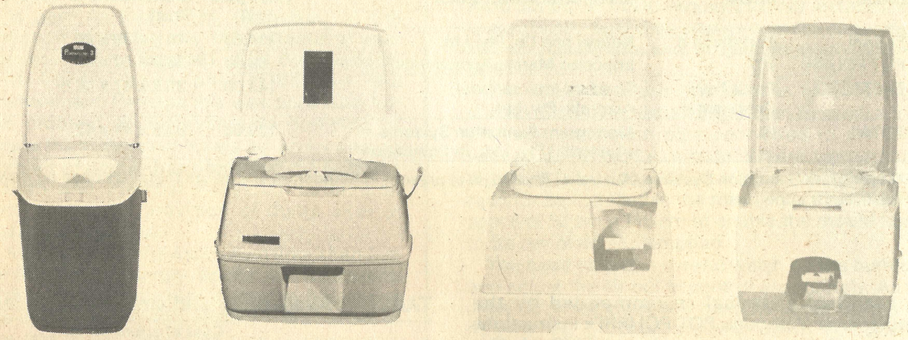
How many days the toilet can be used until it needs to be emptied depends on the number of people in your party and the number of times a day each person uses it. For a family of two adults, TOTA would probably last you about three days without emptying, and POT POURRI approximately six. ELSAN and THETFORD would last you about four and five days respectively.

Seals

On the toilets we bought there is a valve that separates the contents of the storage tank from the bowl. THETFORD and TOTA have the best type of valve – a slide mechanism that has to be opened before the toilet is used and closed afterwards. That way, the contents are sealed off from the bowl. POT POURRI's valve is spring loaded – after you've used the toilet, you hold the valve open with a pedal mechanism at the same time as you flush it. ELSAN's is a counter-balanced hinged flap which does not prevent the contents of the holding tank from returning to the bowl, especially if the tank is reasonably full and the toilet is being transported in, say, a caravan.

Portability and transportability

Each model has a handle for carrying the unit. ELSAN has to be carried upright unless it's empty because of the lack of a positive method of sealing off the contents. The other three models can be carried like a suitcase – the positive seals prevent the contents spilling.



ELSAN POT POURRI THETFORD TOTA

When full POT POURRI is too heavy to carry easily, weighing approximately 27 kg. When ready for emptying, ELSAN (with lid and seat removed) weighs 19 kg, and THETFORD and TOTA, 25 kg and 13.5 kg respectively. With THETFORD and TOTA all you need to carry to the disposal point is the waste storage tank, because the rest of the toilet can be detached.

Flushing

THETFORD and TOTA are once-through flushers, a storage tank supplying clean water for each flush. ELSAN and POT POURRI are recycling flushers; liquid from the waste tank is filtered, used for flushing and returned to the tank until further use. Once the toilets have been emptied, it is relatively easy to clean the filters if they become clogged, simply by hosing them out with water.

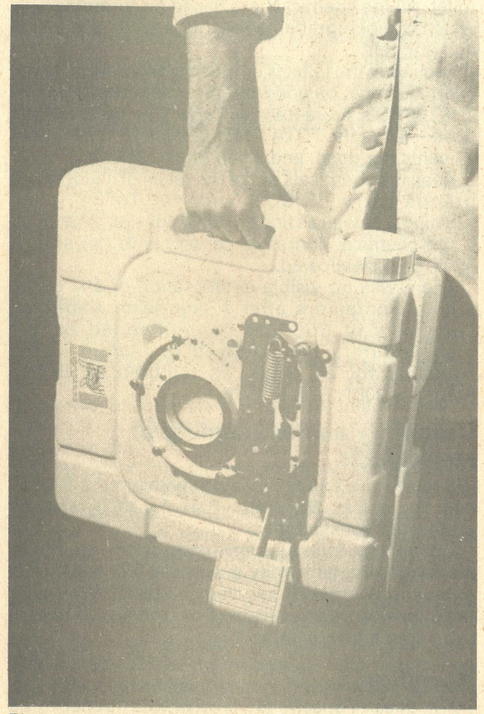
Flushing is by hand-operated pump. The pumps work well and produce a sufficiently powerful flush to clean the bowl. The hand pump on ELSAN is located under the seat; the other three models have their seats designed so that you don't have to lift the seat to get access to the pump.

Emptying

The toilets were easy to empty, THETFORD and TOTA more so than the others because their holding tanks can be detached from the upper bowl sections. You need to take care when emptying ELSAN; the discharge valve is a weak point in the system – it broke during testing.

The chemicals

Only POT POURRI came with a sample supply of the recommended chemical. Where possible we bought



The waste storage tank on THETFORD (pictured) and TOTA can be detached from the rest of the toilet for ease of emptying: their positive seals ensure that the contents won't spill.

TABLE 1: What we bought

Brand	Model	Manufacturer/distributor	Price paid ($)	Dimensions (h x w x l) (cm)
ELSAN	Portaflush 3	Nelson and Co. Pty. Ltd.	114.00	44 x 39 x 45
POT POURRI	707	Imported Marine Accessories	85.00	36.5 x 50 x 47
THETFORD	Porta Potti Continental	Thetford International Australia Pty. Ltd.	143.00	36.5 x 47 x 46.5
TOTA	III	Monogram Sanitation Systems (Australia) Pty. Ltd., in liquidation*	125.00	33.5 x 41 x 42

*Monogram Sanitation Systems (Australia) Pty. Ltd. is at present in liquidation and as yet there has been no new distributor appointed.

the brand of chemical recommended by the manufacturer. Although POT POURRI's instructions recommend that you use only Liquid Gold, this brand is not available in Australia. We used Elsan Blue instead, as the distributors of POT POURRI told us that any brand of chemlcal is suitable for the toilet. All the chemicals are based on formaldehyde which is bio-degradable, although toxic to humans and animals.

Each time the toilet is emptied a new charge of the chemical must be added to the waste holding tank. THETFORD's Aqua-Kem will cost you the most per dose – 47 cents. TOTA's Monochem T5 costs about 27 cents per dose, and Elsan Blue, 18 cents.

Keep the chemicals out of the reach of children. All brands carry POISON and Not To Be Taken warnings, as well as first aid directions on what to do if the chemical comes in contact with the skin or eyes, or is swallowed.

There was no visible deterioration of any of the toilets' containers after a charge of undiluted chemicals of the type recommended by the manufacturers was allowed to remain in the container for 24 hours, as required by British Standard 2081: Part 1: 1976.

Durability and availability of spare parts

We tested the toilets' ability to withstand a load of 400 kg as per BS 2081: Part 1: 1976, and all performed satisfactorily.

On all the toilets, some part of the pump or discharge assembly may eventually fail, and the lid or seat may break, if handled carelessly. We found the following parts available from the distributors at the prices given in Table 2.

Warnings

TOTA doesn't specify the type of toilet paper to be used. ELSAN and THETFORD specify "soft" toilet paper, and POT POURRI "regular" ply. Except for TOTA, the instructions advise against using

TABLE 2: Availability and cost of spare parts

Brand	Cost of spare parts* Lid/seat assembly ($)	Pump assembly ($)	Discharge assembly ($)
ELSAN	16.00	16.00	10.00
POT POURRI	"readily available at reasonable cost"**		
THETFORD	23.00	2.40	16.60
TOTA	19.00	11.50	14.20

* Approximate prices
**Distributor says there is no call for spare parts; no price could be given.

abrasives and other household cleansers which would scratch and damage the plastic; only a mild cleanser should be used. The two clean water flushing toilets – THETFORD and TOTA – instruct that the chemical be put directly into the waste holding tank, not the fresh water tank.

Guarantees

All the toilets came with a guarantee of one year against faults in manufacture.

Conclusions

If you're buying a portable chemical toilet, you need one that is convenient to carry, transport and empty, and has a capacity sufficiently large that you don't have to empty it too frequently.

We found ELSAN to be the least convenient all round because it lacks a positive method of sealing off the contents of the holding tank, and the discharge valve broke during testing. Which of the other three you choose will depend on whether you want a once-through flusher or a re-cycling flusher, and what capacity you need.

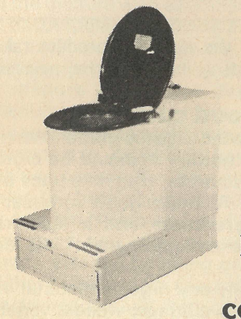
Pre-publication check

ELSAN Portaflush 3 is now $155, POT POURRI 707 $110.00, and TOTA III $130.00. THETFORD Porta Potti Continental is now selling at the same place that we bought it from for $130.00.

Where you empty the toilet

It is easy to think that, compared to the pollution of the big city, the contents of your chemical toilet, disposed of by the roadside, will hardly have any effect on the environment. Perhaps this was once true, but the problem of indiscriminate dumping of waste from chemical toilets by an increasing number of people has prompted the National Health and Medical Research Council to recommend the provision of dump sites at every caravan park.

Always empty the waste from your chemical toilet into a sewage facility for treatment. Although the chemicals make the liquid and the outsides of the faeces sterile, the insides of the faeces are not, providing a favourable environment for bacteria to multiply if left untended. Discharging waste into a septic system could render the system inoperative.



BIO-LOO – the compost toilet

As well as testing portable chemical toilets, we've looked at a much more expensive type of toilet designed for permanent installation rather than for travelling, but one that uses no chemicals and claims to render waste ecologically harmless. BIO-LOO (also known as MULL-TOA) composts waste into a small amount of humus that you can add to your garden for fertiliser. It uses a combination of heat and air to create a favourable environment for the development of decay processes.

You don't need to add chemicals – just a small amount of garden soil and fine cut grass from time to time will feed the system with new micro-organisms for composting. Vegetable scraps will also aid the process.

Used regularly by a family of four, the toilet will require emptying only once a year – and then you've got about 25 kg of humus for your garden, in two easily removed mould boxes.

Notwithstanding the brochure pictures showing BIO-LOO plus seated guest situated in the midst of sand dunes, BIO-LOO requires indoor installation. It is electrically operated, and its success depends on correct installation and proper attention while in use.

The room in which the toilet is to be situated should not be ventilated, other than through a 5 cm diameter ventilation pipe connected to the toilet, with an outlet to the outside. Where temperatures regularly fall below 18°C, it is recommended that a radiator be installed in the room. You'll need a floor space of 53 cm x 115 cm to enable the mould boxes to be removed and emptied.

You need to keep a careful watch on the humidity and adjust the air outlet control accordingly. As the material in the toilet can become caked during the mouldering process, slowing down composting considerably, you should use the "slice iron" regularly to rake the humus down into the mould boxes.

The toilet has a thermostatically controlled heater and a manually operated spreader which is used to distribute the waste evenly in the toilet. Its power consumption, therefore, is very low. If power is cut off, decomposition will still continue, although at a slower rate. If you go away for more than three or four days, you can switch off the power as long as the air outlet is fully open.

We found some minor design weaknesses – the self tapping screws on the polythene mould box cover could very easily start other holes if you weren't careful, and the plastic plug covering the hole into which the slice iron fits tore when it was removed. However, as a system for disposal of waste, we found it to be most effective. We stress, however, the importance of correct installation and proper attention during its operation – some subscribers have had no end of trouble and expense as a result of incorrect installation, although after installation at ACA and four months' use, we had no trouble at all. The guarantee is for 12 months on all parts, but does not cover labour or travel costs.

As yet, BIO-LOO has been approved for use only in South Australia, Victoria and Queensland, and has limited approval in Tasmania, where the unit may only be installed where a septic tank has been approved and must not be installed in the dwelling.

BIO-LOO (also known as MULL-TOA) model HT5 comes from Sweden and is distributed by Environment Equipment Pty. Ltd., 9/65 Queens Road, Melbourne 3000. The price we paid was $635.00 plus $15.00 for fittings. Our pre-publication check found that it would then have cost us $670.00 plus $24.00 for fittings.

COMPOST BINS

Instead of throwing out kitchen scraps with the garbage, or burning off garden waste, an increasing number of people are turning it into compost for their gardens. By composting your garden and kitchen waste, not only are you reducing your contribution to pollution, but you're dispensing with the need for expensive fertilizers and producing your own, at little cost. Yet the Government is actively discouraging this trend of converting waste into useful material by imposing a 15 per cent sales tax on compost bins, while plastic garbage bins and incinerators, which tend to add to environmental pollution rather than avoid it, are on the lower sales tax category of 2½ per cent.

Why your garden needs compost

Soil is made up of mineral matter and organic matter (the decomposed remains of living organisms). The soil contains a number of nutrients that are essential for healthy plant growth, the most important being nitrogen. While other nutrients are obtainable from the mineral matter in the soil, nitrogen is derived only from the organic matter, so that soil containing little organic matter will be deficient in nitrogen, resulting in poor plant growth.

The nitrogen in the soil needs to be continually replenished because it is leached away by water. Without man's interference, this replenishment would usually occur naturally, through the decay of organic material by bacteria and fungi and by its digestion by worms and other soil inhabiting animals and insects. However, this cycle is broken if, as often happens in the home garden, organic material is removed instead of being directed back into the soil. Dead plants, leaves and lawn clippings are usually whisked away to the incinerator, and waste from garden plants and the kitchen is thrown into the garbage bin.

Not only is organic matter important for plant growth as a source of nitrogen, but it supplies other nutrients as well and its incorporation in the soil assists root penetration, increases its water holding capacity and modifies extremes in soil temperature. So by throwing out your waste you're throwing away a very valuable resource.

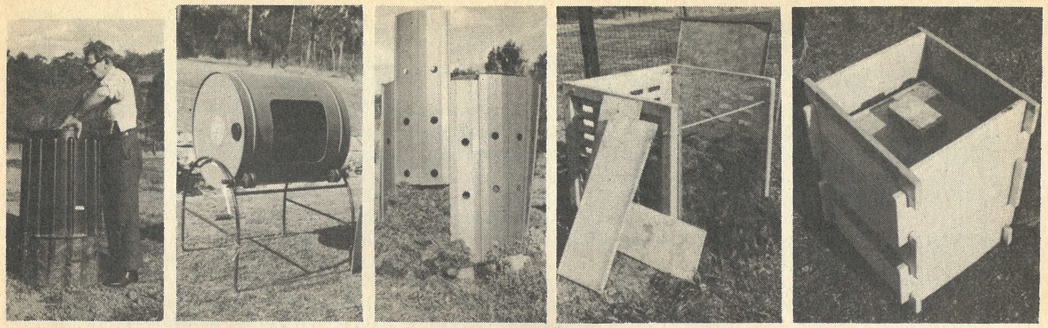
You could dig the material straight into your garden, but it would be of little use because nutrients are not released until decay has well and truly set in. Beneath the soil, this process takes a long time. Composting hastens the necessary process of decay.

How to make good compost

Compost is decomposed organic matter. When it's ready for use in the garden it should be crumbly, dark in colour and odourless, with little trace of the original ingredients. To make good compost you need the right ingredients and a favourable environment for the development of the decay processes.

You can put virtually any organic material into a compost heap – grass cuttings, weeds, vegetable scraps from the kitchen, dead leaves, even sawdust, paper and rags, although these will take much longer to decay. Woody materials such as prunings from trees will take so long to decay that you're better off leaving them out altogether. Don't put egg shells or bones into the compost heap; it won't hurt, but they just won't decay.

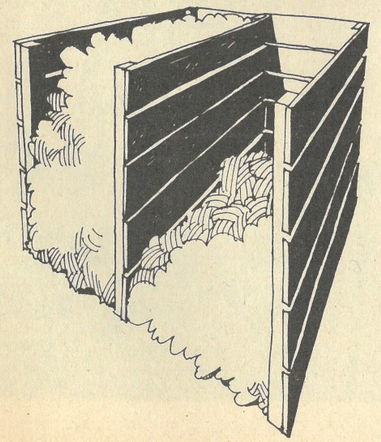
For the development of decay processes, you need a moist, warm and well ventilated environment. Light watering will keep the compost heap moist. If the heap dries out, decomposition will stop; overwatering may cause it to smell. The heat necessary for the development of the decay processes is generated through the breakdown of the material and retained in the heap depending on its shape and size. A wide flat heap will not retain the heat as well as a taller one. The heap should be loosely stacked so that air can get to the centre; otherwise the heap will begin to smell. Turning the heap occasionally can be a great help.



Five basic designs represented from left: GARDEN TREND, COMPOSTUMBLER, ROVER, STEADFAST and WILLOW (see text).

Stack the material in a heap, sheltered from the sun and wind to retain moisture, and locate it in a well drained position to prevent it becoming water logged. A little garden soil on top will deter flies and seed the mixture with essential fungi and bacteria to start decomposition. Adding a little lime and animal manure will also increase the rate of breakdown of materials; lime reduces the acidity of the materials and manure introduces decay organisms and nutrients to the compost heap.

It is preferable to build or buy a container to keep the compost in. Apart from keeping the heap tidy, a container assists the decomposition process by keeping the heap compact and the heat in. Building your own bin is easy and you'll get effective results. If you build two, side by side, as shown in the diagram, you can be filling one while you're using the other or waiting for the material in it to decay. Or there are readymade ones on the market like those we bought.



What we bought

We bought the eight brands of compost bin shown in the Table, the smallest size available in each brand. All but one are the static type – that is, once you've put the material in, you don't need to turn them. COMPOSTUMBLER is a rotary bin, which is turned each day for most effective composting.

We bought the bins at the prices shown from manufacturers or distributors, department, variety or hardware stores.

We did not buy TRENDY as it is the same as GARDEN TREND. The smallest COMPOSTABIN, the 0.21 cu m size (7 cu ft), was not available but we managed to buy the 0.28 cu m size (10 cu ft) for the price of the smaller bin – $39.00 instead of $45.00.

The bins

There were a number of different designs among the ones we bought: the cylindrical plastic bin with close fitting lid (COMPOSTABIN, GARDEN TREND and GEDYE/FIRTH); the revolving steel drum mounted on a frame (COMPOSTUMBLER); the cylindrical plastic container with interlocking panels (ROVER and WINTON); the rectangular container with lift-out side (STEADFAST); and the rectangular container of interlocking pieces (WILLOW).

The bins from plastic or fibreglass are light to carry when empty. COMPOSTUMBLER is made from steel and weighs 40 kg in its frame. STEADFAST, made from precast concrete, is a hefty 145 kg, bolts and fittings included.

All the bins except COMPOSTUMBLER come without a base, since they are meant to rest on the ground with their contents in contact with the soil (so that bacteria and earthworms can get at the compost).

Compost should not be too wet nor too dry so, to protect the compost from the weather, all bins except STEADFAST come with a lid; you would have to buy or make a lid for STEADFAST (we used a corrugated iron sheet as protection).

Most of the bins have ventilation holes. Those that don't are COMPOSTABIN, GARDEN TREND AND GEDYE/FIRTH.

TABLE: What we bought

Brand	Model	Price paid ($)	Manufacturer/ distributor	Stated capacity (m³)**	Approximate dimensions) (mm)	Mass (assembled and empty) (kg)
COMPOSTABIN		39.00*	Rotoplastics Plastics Pty Ltd	0.28	810 diam. x 710	8.0
COMPOSTUMBLER		115.00	Osborne Metal Industries (N.S.W.) Pty Ltd	0.42	1000 x 800 x 1520	40.0
GARDEN TREND		21.98	Garden Trend Pty Ltd	0.2	620 diam. x 790	2.5
GEDYE/FIRTH	Standard	49.95	L. R. & N. R. Gedye Pty Ltd	0.2	710 diam. x 760	7.5
ROVER	Rotocrop Accelerator 18	39.95	Rover Mowers Aust. Pty Ltd	0.53	860 diam. x 920	11.0
STEADFAST		39.95	B. G. Plummer & Co Pty Ltd	0.42	880 x 800 x 790	145.0
WILLOW	Modular	19.98	Willow Ware Pty Ltd	0.19	610 x 610 x 820	1.5
WINTON		35.00	Clark Rubber Stores Pty Ltd	0.23	570 diam. x 920	4.2

* **Obtained for price of smaller unit; see text.**
****Converted to metric units where stated in imperial units.**

Guarantees and instructions

ROVER is the only bin that came with a written guarantee – six months against faulty manufacture.

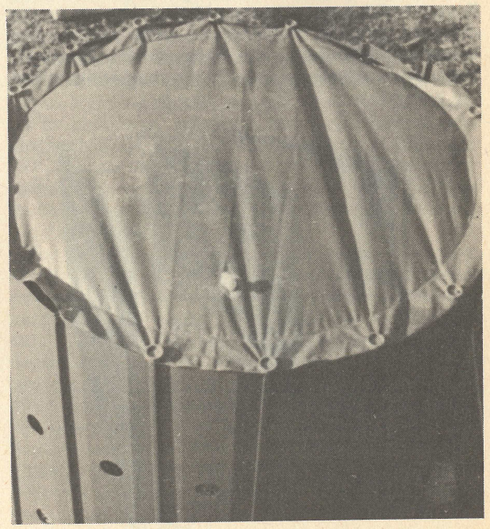
Since the quality of the compost you get depends on your understanding and following the principles of good composting, we think the instructions should provide information on the theory and practice of compost making and how to produce good compost – whether lime, fertilisers or soil are required; the types of materials that are suitable, and whether other additives are needed. In this regard, the instructions with COMPOSTUMBLER and ROVER were very informative. Those with GEDYE/FIRTH, STEADFAST and WILLOW also gave adequate information on how best to make compost and the principles of composting. WINTON didn't come with any instructions, and those with COMPOSTABIN and GARDEN TREND were only fair.

As well as using green materials such as weeds, lawn clippings and organic waste, some instructions suggest using paper, sawdust and even rags in the compost although these take a long time to decay. Most instructions suggest using an activator such as animal manure or blood and bone to start the decomposition process. Several suggest adding one or more of the following: garden soil, lime, superphosphate and sulphate of ammonia.

Assembling the bins

COMPOSTABIN and GEDYE/FIRTH don't need assembling, and COMPOSTUMBLER only needs lifting onto its frame. The rest require some assembly before they can be used. We didn't have any major problems assembling the bins, although STEADFAST took a good deal longer than the rest; its heavy precast concrete sides have to be moved into position and bolted together. You would be wise to assemble STEADFAST where you intend to use it. With WILLOW you need to take care in its assembly and dismantling – the foam panels can easily be broken. It must be positioned on level ground, too, or the bin will take on a decided lean.

ROVER's inflatable cover and studs have to be removed before loading the bin – the studs are fiddly to fasten and unfasten and could easily be lost.



Filling the bins and unloading them

All the bins were easy to fill. With most, you simply load the material into the top of the bin and replace the lid. COMPOSTUMBLER has its opening in the side of the drum because of its height. ROVER was somewhat inconvenient to load; it has an inflatable cover which is secured by removable studs to the top of the bin – they are fiddly to fasten and unfasten for loading, and could easily be lost.

Removing compost from the bins was easy. With COMPOSTABIN, GARDEN TREND and GEDYE/FIRTH you lift the bin off the compost heap, exposing the whole pile. You revolve COMPOSTUMBLER until the aperture is on the under side of the drum, remove the cover and empty the contents into your wheelbarrow located under the drum. ROVER and WINTON have interlocking panels, any number of which can slide up to give access to the compost. WILLOW can be dismantled completely to expose the whole compost heap.

Unobtrusive?

The bins certainly aren't unobtrusive although some come in shades of green to blend into your garden surroundings. The dimensions of the bins are given in the Table. There is an extension available for the 0.28 cu m COMPOSTABIN (retail price approximately $21.00) which increases the capacity by 0.18 cu m (6 cu ft) – it fits into the COMPOSTABIN, adding an extra 40 cm or so to the height of the bin.

If you need to store the bin you might want one that takes up as little room as possible. GARDEN TREND, ROVER, WILLOW and WINTON are light, easy to move when empty, and will fit into a small storage space. COMPOSTABIN and GEDYE/FIRTH are light and easy to move when empty, but require a larger stowage space. STEADFAST can be dismantled and then stored in a relatively small space, but it is quite difficult to move owing to its mass. COMPOSTUMBLER is the most inconvenient to store – it is fairly heavy and requires a relatively large storage space, since there is the drum and the frame to accommodate.

WARNING

The decomposition of organic matter can produce very high concentrations of fungal spores under certain conditions, particularly if the compost heap is not moist enough or if soil is not added. On no account should the clouds of spores which can be produced in turning over a compost heap be inhaled. Not only can they cause allergic reactions, but compounds produced during decay can be dangerous if inhaled.

Compost making

We put the bins on level ground and on loose soil containing plenty of earthworms. Our tests were carried out over the winter months with ambient temperatures ranging from 0°C to 22°C.

The bins were filled mainly with grass cuttings and some vegetable scraps. The manufacturer's instructions were followed in all cases as to whether lime, garden soil, superphosphate or sulphate of ammonia should be added.

Most manufacturers give the time it takes to make compost in their bin. Some say six weeks, others say 10 to 12 weeks, and a few don't commit themselves. COMPOSTUMBLER claims to make compost in 14 days. This may depend on what you put in it – grass clippings, dead leaves and kitchen greens will decompose faster than thick cauliflower stalks, orange peel or cactus plants. We took samples of the compost when the manufacturers claimed the compost would be ready. Where the manufacturer made no claims, we took the sample at 12 weeks.

During the composting process, the volume of organic material is reduced. The bins produced about 60 percent of the original volume of material in compost at the end of the composting time.

Temperatures

The temperature in a compost heap rises to a maximum after the first few days when activity of micro-organisms in the heap reaches a peak. The higher the temperature the faster the decomposition. The bins should be well enough ventilated to provide a suitable environment for the growth of bacteria, yet at the same time designed so that not too much heat is lost.

We measured the maximum temperature reached in the centre of each heap. The highest temperatures were recorded with COMPOSTUMBLER and WILLOW (64°C) and STEADFAST (62°C), the lowest with COMPOSTABIN and WINTON (51°C and 52°C respectively). These lower temperatures were still high enough for effective decomposition to occur.

How good is the compost

Compost should be dark in colour; crumbly and odourless. All bins produced compost of a loose friable texture but COMPOSTUMBLER produced dark and odourless compost that was judged to be of the highest quality of all. Compost from the other bins was not always completely decomposed, and some was dried out on top and on the outside. There was also a slight musty smell (see box).

Although COMPOSTUMBLER produced the best compost, and in only 14 days, it has certain disadvantages. It requires daily attention – five turns

of the drum each day for 14 days. Also, the drum should be filled right up – "extremely important to generate the right degree of heat...to produce the required bacteriological breakdown. If the drum is only half-full, you lose the maximum effect." Many users may find it difficult to find enough material to fill the drum.

The other bins don't produce compost that is fully decomposed under 12 weeks. Even then it is not of as high a quality as the compost produced by COMPOSTUMBLER. However, these bins do produce compost with little effort or time from you – all you have to do is make sure they don't dry out.

Conclusions and recommendations

The COMPOSTUMBLER is definitely the best compost-maker of those we tested, although it is also by far the most expensive. It is really only worth the money if you can supply enough organic material to fill the bin, can make use of a constant supply of compost, can be available each day to turn the drum and have the space in your yard to put it.

For one-person families producing small volumes of garden and kitchen waste for the bin, with a small garden to fertilise and with constraints on space available for the bin, WILLOW would be your best bet. It's very light (only 1.5 kg empty) and fits together like a jigsaw puzzle. It's good for storing, too. It has a smaller capacity than the other bins so you don't need as much material to fill it and you won't be overwhelmed by the amount of compost produced. It's the cheapest of the bins tested – $19.98.

COMPOSTABIN is a good sturdy bin with a large capacity (and even larger if you buy the extension). It's not particularly pleasing in appearance and rather bulky for storing, but it will do the job and should last well.

Unless you want compost in 14 days, such as you'd get with COMPOSTUMBLER, you don't really need to buy a bin. As long as you follow the basic principles of composting, you can make compost quite successfully in a home-made version of the bins we tested, simply by building a box-like structure of bricks or wood, or converting an old 44 gallon drum or even, at a pinch, an upturned garbage bin.

Pre-publication check

Of the recommended compost bins, COMPOSTABIN is at its normal price of $45.00 (we bought it for $39.00). WILLOW is still the same price, but COMPOSTUMBLER now costs $140.00.

ENGINE TUNING KITS

A car engine is a complex machine which must be carefully adjusted to give its best performance. The running of the engine depends on a large number of co-ordinated mechanical and electrical interactions, and if any of these is thrown out of alignment the performance of the engine as a whole will suffer.

Having your engine tuned at regular intervals will keep it running at its best. It also makes good sense economically, because a properly tuned engine is also at its most efficient.

Paying a garage to tune your engine can be expensive, however. The alternative is to do it yourself. One way is to use tools, feeler gauges and a little know how. The other is to supplement these with a selection of electronic instruments specifically designed for tuning. You'll still need the know how to do the job properly, and a manual to tell you the adjustments to make, but they'll make things a lot easier and help you to do a more efficient job.

The main adjustments

Most car engines produce power through the ignition of a mixture of petrol vapour and air in an enclosed space, the cylinder. Most of the events leading up to and including the actual ignition of the combustible mixture are controlled by the rotation of the engine. Tuning the engine involves adjusting the co-ordination of these events so that they each occur at precisely the right time in the engine's cycle.

There are many important adjustments which must be made to the engine. Some can be made with tuning instruments and some can't. Among the non-instrumented ones are valve clearances, carburettor settings and the condition of spark plugs, coil, condenser and high tension leads.

Two of the most important instrumented adjustments are **ignition timing** and **ignition dwell angle.** A spark must be produced in each of the engine's cylinders in correct sequence and at just the right time in the engine cycle – that is, to coincide with a particular position of the piston in the cylinder. The order of firing of the spark plugs is controlled by the distributor, and the **timing** depends on the position at which the distributor is set relative to the engine's rotation. (Timing is varied according to engine speed and throttle position, but this is done by related mechanisms in the distributor.)

As well as being produced at the right time, the spark must also be of sufficient strength to ignite all the combustible mixture. This, too, is controlled in the distributor by the contact breaker points or an electronic equivalent. These points must stay shut long enough between the firing of each spark plug to allow a spark of adequate strength to be generated – in terms of the engine's rotation, the **dwell angle** must be right.

The ignition timing can be set either with or without the engine running. The setting will be different depending on the method used.

Static setting, without the engine running, is done by checking the position of the engine's timing marks against the opening of the contact breaker points, and adjusting the distributor as required. To set the timing with the engine running (dynamically) you need a **timing light.** Connected to one of the spark plugs, this flashes every time the plug fires. By directing the light produced at the timing marks, they can be made to appear stationary – through the stroboscopic effect – and timing accuracy can be checked. As the dynamic setting varies with engine speed, you will also need a **tachometer** (which measures engine speed) if you are to use a timing light. Setting the timing dynamically is by far the best method of adjustment, and most manufacturers today specify dynamic, and not static, settings.

The second important timing adjustment, setting the dwell angle, is done with a **dwell meter,** which is often combined with a tachometer in one unit. The dwell angle is usually adjusted with the engine stopped, but must be measured with it running to obtain the correct setting.

Other tuning instruments

Other tuning aids available are primarily diagnostic, and will help you to locate faults. They should be used regularly to check other aspects of performance if you are to get the full benefit from tuning. Most tune up kits include one or more of these supplementary instruments.

A **compression gauge** fits into the spark plug hole and is used to check that combustion gases aren't leaking past the pistons, valves, or head gasket.

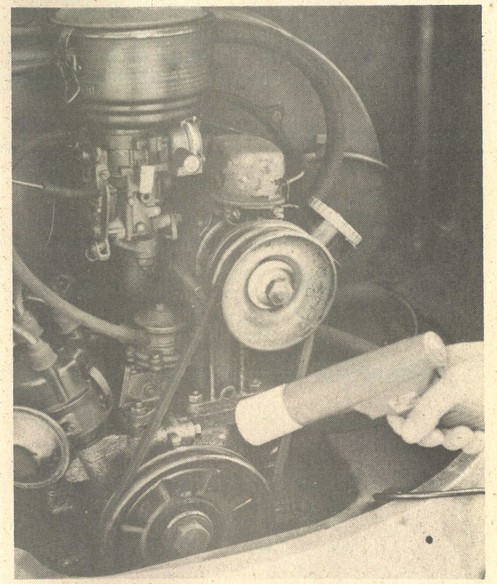
In addition to setting the engine speed during dynamic timing, a **tachometer** is necessary for adjusting normal and choke idling speeds, especially important for cars with automatic transmission where this can be quite critical – too slow and the engine will stall, too fast and it will be pulling against the brakes when stationary.

Charging and starting circuits, and other electrical matters, will need to be checked with a **voltmeter** and an **ammeter,** often supplied in tune up kits, and the condition of the contact breaker points may be assessed by means of a **points resistance scale** (or an ohm meter).

Finally, a **vacuum/pressure gauge** can be used diagnostically to detect faults in valves, ignition system or carburettor.

What we bought

Where possible, we purchased tuning kits containing at least the two basic tune-up instruments, timing light and dwell-tachometer; otherwise, we bought them as individual items. Details of our purchases are given in the Table on page 28.



Ignition timing is checked dynamically by noting the position of the engine's timing marks by the special illumination from a timing light, which flashes in synchronism with the engine's rotation so that the timing marks appear to be stationary.

Guarantees

Most of the equipment we bought was covered by a guarantee, although it is doubtful how much practical use some of these would be, as a number of units had only American guarantees. These were for varying periods, and covered defective or faulty parts or workmanship, provided that the unit was returned to the American manufacturer (HAWK, R.A.C. and VANE).

DIXCO's guarantee did not have a time limit, and specified that a faulty unit should be returned for service to the shop from which it was purchased.

KAR CHECK, MICRONTA, VANE and the UNBRANDED kit each had a three month or 90 day Australian warranty, and the KAR MATE 5000 dwell-tachometer had a 12 month guarantee and its gauges had 90 days.

Instructions

All units were supplied with some sort of written material. Ideally, you should have both a general guide to tuning and instructions for using the particular instruments provided. No set of literature was completely satisfactory.

All omitted data for some engine types. Nevertheless, those with five of the eight kits were considered generally quite informative (DIXCO, HAWK, KAR MATE, R.A.C. and UNBRANDED). KAR MATE alone gave specifications for Australian vehicles.

KAR CHECK came with a tune up guide which was reasonably useful, although clearly not meant for the instruments supplied. Consequently, it was inadequate as a set of instructions.

TABLE What we bought

Brand and model	Price paid ($)	Manufacturer/ Distributor	Contents of kit
DIXCO 1333	76.60	Eastern Tool Company Australia Pty. Ltd.	Timing light, dwell-tachometer, compression tester, vacuum tester, remote starter switch, instructions
HAWK Diagnostic Tune-up Kit	64.00	Hose and Equipment Co. Pty. Ltd.	Dwell-tachometer, timing light, compression tester, remote starter switch (HAWK Tune-up Guide, $1.50), instructions
KAR CHECK 2097	67.50	Greg Buckeridge & Co. Pty. Ltd., Melbourne	Timing light, dwell-tachometer, compression tester, jumper leads
KAR MATE 5000 13467	16.98 14.98	K-Mart Aust. Ltd.	Dwell-tachometer, instructions Timing light, compression tester, vacuum gauge, remote starter switch, operating manual
MICRONTA 22-1634	49.95	Tandy Electronics	Dwell-tachometer combined with timing light, operating manual, wiring diagram, 3 books of tune-up data for US and foreign cars
R.A.C. 820	46.50	Repco Auto Parts Pty. Ltd.	Timing light incorporating remote starter switch, dwell-tachometer, compression tester, vacuum gauge, operating manual
VANE 31 Maxi-Tune Analyzer	15.52 81.08	Applied Power Australia Ltd.	Timing light, instructions Dwell-tachometer, instructions
UNBRANDED KIT 'f.m. auto' Diagnostic tune-up analyzer	34.75	Dick Smith Electronics Pty. Ltd.	Dwell-tachometer, instructions
TL-188	23.50		Timing light, instructions

Timing lights

The timing lights we tested were of two types: a simple **neon** light type, and a **xenon** light type, which was powered by the car battery. We considered performance from two points of view: brightness (the brigher the light the easier it is to see the timing marks) and convenience (the light should be safe and allow you to keep away from dangerous moving parts while using it).

Brand	Light	Brightness	Convenience
DIXCO	Xenon	••••	•••
HAWK	Neon	•••	••
KAR CHECK	Neon	••	••
KAR MATE	Neon	•	••
MICRONTA	Xenon	••••	•
R.A.C.	Neon	•	••
VANE	Neon	•	•
UNBRANDED	Xenon	••••	••

(the more dots the better)

Generally, the neon types did not produce a bright enough light to be of much use, although HAWK's was passable. The xenon lights were much better, giving a much brighter light of shorter duration. However, the MICRONTA, which incorporated timing light and dwell-tachometer in one, was not at all convenient to use, being much too bulky. Of the three xenon units, only DIXCO was comfortable to hold and easy to use.

Dwell-tachometers

All the dwell meters were combined with tachometers, and several also had additional electrical scales (dealt with below) and a facility for checking points resistance. Apart from the VANE and the UNBRANDED units, which could be rested on the car body, all meters were designed to be hand held, and all could be used with four, six and eight cylinder engines (eight cylinder read-outs are doubled to give appropriate four cylinder figures). KAR CHECK was more convenient to use when held in the right hand (and could therefore suit left handed people).

Accuracy is particularly important with dwell angle and engine speed readings, and a precision instrument is essential. KAR MATE was the only unit which gave the sort of accuracy that is really needed. HAWK, KAR CHECK, MICRONTA and the UNBRANDED were reasonably accurate.

DWELL-TACHOMETERS

Brand	Scales			Accuracy		Convenience
	Dwell (degrees)	Tachometer (rpm)	Points resistance?	Dwell	Tach	
DIXCO	10 to 45 14 to 60	0 to 1500 0 to 2000	No	•••	•	••••
HAWK	15 to 45 20 to 60	0 to 1200 0 to 1600	No	••	•••	•••
KAR CHECK	15 to 45 20 to 60	0 to 1200 0 to 1600	Yes	•••	••	••
KAR MATE	0 to 90 0 to 60	0 to 1200 0 to 6000	Yes*	•••	••••	••••
MICRONTA	15 to 45 20 to 60	0 to 2000 0 to 1500	Yes**	•••	••	•
R.A.C.	15 to 45 20 to 60	0 to 1200 0 to 1600	No	••	•	•••
VANE	15 to 45 20 to 60	400 to 6600 0 to 1600	Yes**	•	•••	•••
UNBRANDED	0 to 45 0 to 60	0 to 1200 0 to 6000	Yes**	••	••••	••

(the more dots the better)

*had an ohm meter for measuring points resistance, scale 0 to ∞
**points resistance scale was inaccurate

Compression gauges

A compression gauge, like the rest of the other instruments, isn't essential for tuning up your car engine, although it is necessary if you want to do the job properly.

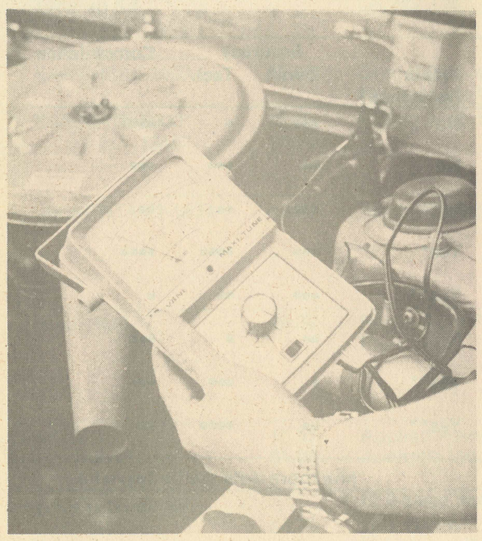
Brand	Accuracy	Convenience
DIXCO	●●●	●●●●
HAWK	●	●●●
KAR CHECK	●●	●●●●
KAR MATE	●●●	●●●●
R.A.C.	●	●●●●

(the more dots the better)

All the gauges were quite convenient to use, but only DIXCO and KAR MATE were particularly accurate. The R.A.C. gauge was the same as the KAR MATE except for the name, but read about 15 per cent low. Nevertheless, accuracy is not as important as repeatability with this device, and all were good in this respect.

Vacuum/pressure gauges

This instrument will only be of use to the experienced home mechanic. Of the three we tested, none was very accurate. KAR MATE and R.A.C. both read slightly low, and DIXCO read lower still. All were acceptably convenient to use.



A dwell-tachometer can be used to check two aspects of engine performance – ignition dwell angle and engine speed – and sometimes points resistance.

Voltmeters and ammeters

Three of the dwell-tachometers incorporated scales for measuring voltage and current.

Brand	Scales		Accuracy
	Voltage (V)	Current (A)	
KAR MATE	0 to 16	0 to 60	●●●
VANE	0 to 16	–5 to 80	●
UNBRANDED	0 to 16	0 to 80	●●●

(the more dots the better)

Voltage accuracy is quite important when adjusting generator output, and VANE wasn't acceptable.

Remote starter switch

A remote starter switch can be very useful during tuning. It allows a person on his own to turn the engine over or start it from outside (with much care) if required. Four brands, DIXCO, HAWK, KAR MATE and R.A.C. supplied these switches in their kits. While they can be helpful, however, it is important that they are designed in such a way that they cannot be triggered inadvertently – especially when your hands are around movable engine parts. KAR MATE's design was the safest; R.A.C.'s, being built into the timing light like a trigger, was the worst and potentially dangerous and damaging if operated while the engine was running. DIXCO and HAWK were satisfactory.

Conclusions

If you are seriously thinking of doing your own engine tuning, a selection of electronic tune up instruments should prove to be a good investment. Provided that you buy wisely, they can make tuning much easier and more effective than using static methods.

There doesn't seem to be much point buying a complete tune up kit – accuracy and convenience were not consistent enough, and you probably won't use all the instruments, anyway. The best policy is to buy the instruments you want individually.

For basic tuning you'll need a powered timing light (DIXCO was our best performer) and a reasonably accurate dwell-tachometer. Of the meters we tested KAR MATE performed best, had electrical test scales and was modestly priced.

A remote starter is a good idea, but make sure you buy one which is unlikely to be switched on accidentally.

The choice of additional gauges and meters is a personal matter, unless they come in a complete tune up kit. All are fairly straightforward to use, so look for instruments which we have noted as being accurate.

Jottings

Just a lot of froth and bubble?

After COLD POWER's poor performance in our washing tests (CHOICE, March 1977), we were keen to test the "improved formula" COLD POWER which its manufacturer, Colgate-Palmolive Pty Ltd, claims will give "improved cold water cleaning".

Pieces of white sheeting, stained with oil, mud, coffee, blue ball point pen ink, lipstick and pencil, were washed with the new "improved" COLD POWER, and the old version (COLD POWER Blue) for comparison. We used a cold water wash, cold water rinse cycle and 135 grams of each detergent, as instructed on the packaging.

In general, the "improved" COLD POWER was no better at removing stains than the unimproved version. If anything, the original COLD POWER was slightly better than the "improved" version at removing lipstick and ball point stains. Only at removing heavy oil staining was the "improved formula" COLD POWER better than the old version – and then only marginally.

Analysis of both washing powders revealed that the new COLD POWER contained approximately twice the quantity by weight of surfactant than previously. A new formula? Certainly. But is it improved?

School photographs

In CHOICE, July 1977, we asked parents of school children to tell us of their experiences with school photographs by replying to nine questions. We were concerned to know whether parents were satisfied with the present system for taking photos at schools and whether they thought that the photos represented good value for money.

The results of our survey showed that, by and large, those who took part were happy with their school photos and thought the prices charged were reasonable. However, several interesting factors did emerge in relation to price discrepancies. For example, prices charged for the most popular size photo ("postcard" size) usually ranged from $1.50 to $4.00 each.

The major firms involved in school photography appear to offer the school a "package deal" by which the school benefits through a commission on photo sales. Some firms also offer the school identity photos of all pupils and class and teacher photos as part of their offer.

While we believe that the prices charged are rather high in some cases, school photos obviously represent a way for schools to make money and, as long as parents are happy with the end product and feel under no obligation to buy, the system seems to be working to the satisfaction of everyone involved.

CAVEAT EMPTOR

Mr Owen Mortimer, Managing Director of Mortimer Ford Pty. Ltd. of Mildura, has contacted us to point out that he is not the Owen Mortimer mentioned on page 361 of our article Caveat Emptor in CHOICE, October, 1977. The article quoted part of the annual report of the Commissioner for Consumer Affairs for South Australia, in which a Mr Mortimer was mentioned under the heading 'Second hand motor vehicles'.

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A correction

We regret that in the December issue we erroneously reported on page 430 that CHOICE could not be mailed during most of December. Seasonal mailing restrictions do not apply to registered publications. This issue of CHOICE will be posted late in December, but will not reach most subscribers until some time after the start of the month.

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January 1978
The month and year refer to CHOICE reports.
*Additions and corrections to previous reports.
(E) Article inside front cover.
(G) General advice article with no brand recommendations.
(J) Jotting or short note.
(L) Letter.
Test reports and surveys have no symbols.

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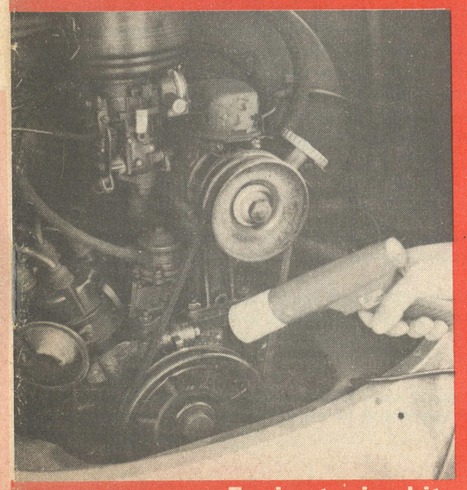
Pocket cameras

Compost bins



Engine tuning kits

CHOICE

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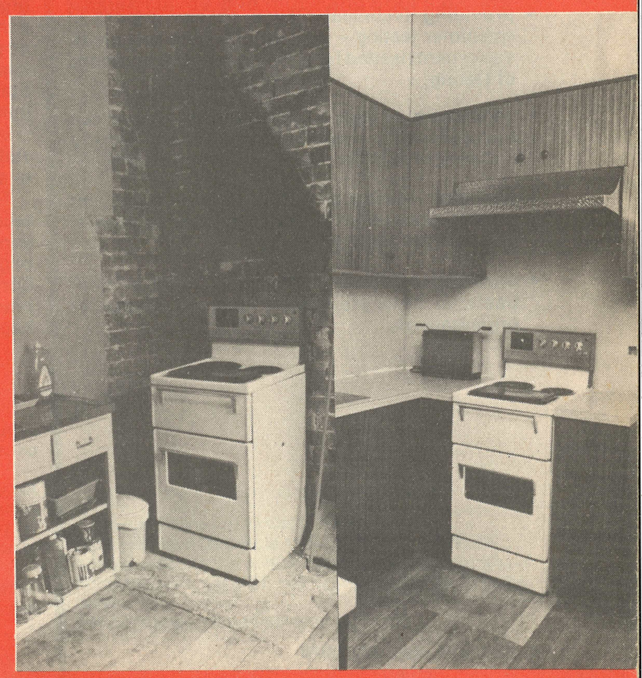
Mini TV



Kitchen renovations